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THE

TIMES AND REGISTER.

A Weekly Journal of Medicine and Surgery.

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The thought of all the drugs I've ta'en calls up the blinding tears;
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At sight of the tomato plant will vanish quite away.

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Original Articles.

PREVENTIVE INOCULATION.[1]

BY FRANK S. BILLINGS.

PREVENTIVE inoculation is an unquestionable possibility in all diseases of a non-recurrent character. Nature has indicated this fact for hundreds of years, but man has scarcely learned to appreciate it. We start upon an already open path. At its very entrance we can see the guide-post "non-recurrent." To pass on to success requires simply honest and heroic workers. The spirit of a common humanity should rule where greed for the almighty dollar now reigns supreme. The nation itself must be educated to an appreciation of what can be done; then success will come. Only heroes can do such work. The present reign of mediocrity and unprincipled selfishness in our laboratories must be crushed. Better anarchy than the existing conditions! Fraud rules in the place of scientific honesty. Salary grabbers occupy places which should be filled by original investigators with the true scientific spirit. No mind but a free one can investigate correctly.

The Difference Between Experimental and Preventive Inoculation.—These two procedures must be most sharply differentiated. While preventive inoculation must necessarily depend upon experimental for its perfection, we have no need to resort to it to demonstrate prophylaxis by this method to be a possible fact. Preventive inoculation does not depend upon experimental for its demonstration as a possibility. Nature has already done that, as mentioned.

The True Value of Experimental Inoculation.—What do we mean by experimental inoculation? Let us thoroughly understand that first.

By experimental inoculation we simply mean the transference of the disease products (or, pure cultivations of the micro-organismal cause of a given disease) from diseased to healthy individuals of the same, or other species of animal life, in order to see what the results may be.

It is an attempt at transference, nothing more.

The success of such an experiment is determined entirely by the nutrition offered, by the animals inoculated, to the germs of the disease inoculated.

The amount of imbecile nonsense which has crept into medical literature upon this subject is almost indescribable. Koch and his school are almost entirely to blame for it. It shows an utter want of true pathological knowledge and philosophical acumen. It is entirely wanting in sequential logic.

It has been assumed that experimental inoculation in small animals must of necessity determine the real nature of the disease of the animal from which they were inoculated. Such a hypothesis is absolutely absurd. It need not necessarily determine anything of the kind.

These writers do not know the logical definition of the word *contagious*. While they frequently write deftly about "faculative" and "obligatory parasites," their language in regard to the results of experimental inoculation shows that they use words without knowing their logical application. They speak of the "contagion of anthrax" (a faculative parasitic disease), and the "contagion of glanders" (an obligatory parasitic disease), in the same breath. Logically speaking, the word "contagious" simply means the coming in contact with an infectious principle, utterly regardless of its origin. It may be a syphilitic person in one case, and a filth hole in the ground in another. Both may be equally "contagious," but the inficiens in each case had a different origin. This, and this alone, must decide the nature of a disease. They must, of necessity, be either ex- or endogenous primarily. Practically, all

[1] Read before the Section for State Medicine at the Annual Meeting of the American Medical Association, Nashville, Tenn., May 22, 1890; and the Chicago Medical Society, June 2, 1890.

physicians and hygienists know what they mean by a "contagious" disease. They mean that a diseased individual must be, or has been, present of a given species of animal life as its primary source of origin. Historically, we know of no other primary genesis for these diseases. We know that no individual can acquire syphilis, or glanders, or scarlet, or mumps, unless an individual having been afflicted with one of these diseases has been in the immediate vicinity. The closeness of the contact necessarily varies in different diseases. Remove such diseased individuals, clean up or destroy their belongings, and the danger of contagion is removed.

Experimental inoculation cannot strengthen the case in the least degree. The endogenous character of such diseases, that they were strictly contagious in the practical sense, was known centuries before a bacterium was ever heard of. Only bacterio-fanatics seem to be ignorant of this fact. Inoculation of small animals cannot strengthen it an iota. To ignorant minds it might weaken the practical everyday evidence. All animals are not equally susceptible to a given inficiens. Even though experimentally inoculable, a given contagious disease often loses its specific, practical characteristic by inoculation in experimental animals of a given species, but different from that in which it naturally occurs. For instance: glanders, transmitted from a diseased horse to rabbits or guinea-pigs, will not extend, of itself, to uninoculated rabbits or guinea-pigs. It is not contagious in these animals.

A recent writer says that the "crucial test" of the contagiousness of tuberculosis was only obtained when the results of inoculation in rabbits and guinea-pigs had become known. Nonsense! The "crucial test" is the result of contact between diseased and healthy individuals of the species in which a disease naturally occurs, or is naturally transmitted to by accident. According to these absurdly illogical observers of pathological phenomena, syphilis should not be contagious because non-transmissable by inoculation to domestic animals. Why any sane person, looking upon himself as an investigator, especially such an one as Koch, should speak of the contagion of anthrax, swine, plague, diphtheritis, or rabbit septicemia, passes one's comprehension. The latter disease has been especially mentioned, because it is not a natural disease in rabbits, simply to demonstrate the utter absurdity of this position.

The word "contagious" does not properly express the practical and hygienic meaning attached to the diseases to which that name has been given. As repeatedly stated, and as must be definitely understood, it simply means contact with an inficiens, and has no absolutely necessary connection with origin. Let us illustrate this with an example: A physician makes an autopsy on two different people on the same day; the one has perished from syphilis, the other from anthrax. In both cases he accidentally cuts a different finger, and in one becomes a chancre, in the other a malignant pustule develops. Such a thing is possible, but not probable. What has taken place? Accidental inoculation, through contact with two differently-diseased individuals — contagion. The primary origin of these two diseases has been entirely different, however. The syphilis primarily originated from another individual; the anthrax from the ground of some locality. The one is endogenous, the other exogenous. This at once demonstrates the folly of any further use of the word "contagious" in the differential classification of diseases, as it does not express our true meaning.

To sum up, then, we can logically speak of diseases as extra-organismal, or exogenous; intra-organismal, or endogenous, and sporadic—that is, of undemonstrable origin; or, in other words, from the etiological point of view we can logically only classify diseases according to the primary origin of their cause. Or, to speak with Hueppe, as "obligatory parasites," by which he means that such etiological moments are primarily bound on the conditions offered by some form of animal life for their existence and continuous development; or, in other words, such diseases are "endogenous" in origin, to speak with Pettenkofer, or intra-organismal in origin, as I have termed it.

An endogenous disease is one which, so far as we can historically trace its genesis, has found, and still finds, its locus of primary origin for each new outbreak or extension of the disease in a diseased individual of some given species of animal life (and never in any other way), and then passes directly from the diseased individual to another susceptible, healthy one, either by direct contact or cohabitation, or by contact with some effluvia, secretion, or other material which has either come directly from, or been in immediate contact or relation with, such a diseased individual.

Speaking in the old sense, such a disease would be "contagious." Speaking according to the nonsensical usage of the word at present, no one can tell what its true origin might have been.

In contradistinction to obligatory parasitic diseases, Hueppe has given us the term "faculative parasites," by which he means to indicate diseases of parasitic origin, in which the point of primary development of the germs is invariably outside the animal organism; but they have the faculty of living for a time within the organism of certain species of animal life, becoming parasitic or disease-producing for the time, when such animal organisms offer the necessary nutrient conditions to their life. To this class Pettenkofer has given the name "exogenous," while I have termed them "extra-organismal," or diseases which find their primary origin in external or surrounding conditions. Or, in other words:

An exogenous disease is one which invariably finds its locus of primary origin not in, but outside of, an animal organism; that is, in the earth, or in the surroundings of animal life, where its micro-organismal cause develops under certain conditions of climate and soil, which offer the necessary nutrient conditions to the life and continuous development of its germ.

The infected earth or locality bears the same relation to animal life in the origin of exogenous diseases that the infected animal organism does to healthy susceptible animals in endogenous diseases; that is, they each form centers of primary origin regarding specific diseases in their respective class, but with this difference: *the focus of primary generation, or infection, is fixed in exogenous diseases, while it is movable in endogenous.*

The locus infectionis, that is, the point of primary infection or origin, is contagious in either case. In the one, a healthy susceptible individual must come in direct contact—that is, be upon, or in, such an infected locality, or come in contact with material derived directly from such a locality; while in an endogenous disease the same occurrences must take place in reference to some form of animal life. Hence it is to be readily seen that the word "contagious" has no logical use or place in the nosology of diseases, according to the results of modern methods of investigation.

Preventive Inoculation.—Preventive inoculation is an entirely different procedure. It is based upon a natural phenomenon, viz., that a given disease is non-recurrent in character. But more; that this non-recurrent condition of the organism is produced equally as well in the mildest attack of a given disease as in cases in which the diseased individual barely escapes with life. Diseases of this non-recurrent character are small-pox, typhus-abdominalis (vulgarly called typhoid fever), measles, mumps, scarlet, whooping-cough, chicken-pox, yellow fever, and some others in the human family; and in the domestic animals some of the so-called horse distempers, contagious pleuro-pneumonia in cattle; anthrax, swine-plague, rouget in swine; hen-cholera, Southern cattle plague, (Texas fever), and black-leg, and probably the corn-fodder disease, and others.

Some authorities assert that Asiatic cholera is also non-recurrent in character, and I am inclined to think that glanders can be made so by the inoculation of farcy in a mild form. There are probably quite a number of these diseases still unknown to us in the poorly-investigated portions of the globe. I am one of those who, at present, does not believe that rabies is a non-recurrent disease, and hence have no faith in inoculation as a preventive. That non-recurrent diseases can be prevented by inoculation was first discovered in small-pox, and then demonstrated by Pasteur to be possible in anthrax, hen cholera, and rouget, and by Arloing and others in black-leg; by Willems in pleuro-pneumonia in cattle; by Freire in yellow fever in Brazil; by the author in swine-plague, and by Dr. Paquin, of Missouri, in Texas fever in this country. With none of these diseases but small-pox can we claim to have arrived at any perfected method; but still, the immense losses incurred, and the practical results which have followed, warrant the continuation of present methods until others are discovered, or these improved upon. The value of their discovery, and the practical demonstration that inoculation will prevent in the diseases enumerated, cannot be overestimated. It shows what can be done, and will be a stimulus to more extended endeavors. It is my firm belief that before the end of the next century every non-recurrent disease at present known to us will have been brought under the control of preventive inoculation, but more especially those of child-life.

Who can place a monetary value upon such results? Is not the mere possibility of such a result promised, as it is directly, to us by the very non-recurring nature of these plagues of our babes, sufficient to warrant the establishment and maintenance of laboratories for such investigations by our National and States Governments? Is it not the duty and mission of a broad and wise statesmanship to meet this great want? Is not a vigorous and healthy condition of our people the very kernel of a prosperous political economy? Then why are we sleeping? Why is the medical profession so dead to its duty? Is it that a prosperous grave-yard makes plump pocket-books? No! no! It is ignorance and thoughtlessness; but, most of all, a lack of the true, humane, and noble spirit which should dignify the medical profession of a country.

A perfected condition of the human race should be the only ideal to be sought after by the medical profession. Exact and scientific government schools can alone produce this desired condition. Speculative institutions, or any such as depend either in part or in toto upon students' fees for support, can never give anything of value to the country. They may turn out a few competent physicians, but never scientifically qualified ones.

With this introduction, let us turn to the consideration of preventive inoculation once more, especially to its introduction in relation to small-pox. We have said that inoculation was the transmission of the products, or cause, of disease from a diseased to a healthy individual. In relation to the prevention of small-pox, this procedure is known as *variolation*.

To repeat: variolation was, or is, the transmission of small-pox itself from diseased persons to healthy ones, by the inoculation of the products of disease themselves. This procedure was first practiced by the Chinese and East Indians, a long time before the birth of Christ; but was not inaugurated in Europe until many centuries later. Small pox itself is produced. Why, then, was it resorted to? Any one at all acquainted with epidemiological history of diseases before this century, especially in the fifteenth, sixteenth, seventeenth, and eighteenth centuries, must know what terrible misery and desolation this plague caused. Many districts, and even cities and towns of considerable extent, were almost depopulated by it.

We of to-day can scarcely form any idea of the ravages of small-pox in Europe in the past centuries; but the quotations of a few figures will at once enlighten us; and when they are compared with the same results of to-day, the benefits of vaccination become at once apparent.

Between 1866 and 1869, 140,000 people died of small-pox in the departments of Bombay and Calcutta; and in all India, in 1874–5, the deaths from this cause were estimated at 500,000; and 200,000 in 1875–6. Between the years 1711 and 1740, 65,000 people are reported to have died from small-pox in England. In 1734, two-thirds of the population of Greenland died--7,000. The deaths from this disease equalled the births at Turin, Italy, from 1796 to 1797. In Prague, Germany, the deaths were 6,686 in 1796, and 15,558 in 1799. In Prussia, 1796, 24,646. In the province of Wurtemberg, in 1790–1800, 36,933. France, from 1726 to 1754, 760,000, of which Condamine says[1] that this number of lives could have been largely saved had there been a general recourse to variolation. In Sweden, from 1749 to 1765, 144,194 deaths from small-pox were reported. In London, in sixty-seven years the deaths from this cause were 113,851; and from 1837 to 1840, 36,000.

Why was variolation resorted to? There must have been some one striking phenomenon in the clinical history of the disease which attracted even the general attention of the common people. What was it? It was the fact that the disease, in general, was "non-recurrent" in character. Outbreaks at that period of the world's history occurred almost constantly, though in some years, or at intervals, to a far more murderous degree than at others. This condition of things soon demonstrated to the people that, as a rule, those who had the disease once seldom suffered a second attack. They had abundant opportunities to test this fact. They also discovered a second fact, which was of far greater importance. They noticed that in years when the disease only appeared here and there among the people, and not as a general epidemic, that it was unusually mild in character; and also, that those catching (contagion) the disease from others generally had the small-pox in the same mild manner. In other words, as in other things in nature, they saw that "like (generally) be-

[1] Memoire sur l'inoculation de la petite-veriole, 1854.

gat like," or that a mild, a non-malignant type of small-pox in one individual generally produced the same character in another, if exposed to infection from the first. As has been intimated, the Chinese, and other Asiatic people, observed this valuable fact centuries before it received any recognition in Europe. They were then well acquainted with several facts in the history of small-pox, which were:

1. That when malignant in its first appearance, it would preserve that character among the whole population.
2. That when mild it held the same course.
3. That it was non-recurrent, as a rule.

This last was a tremendous discovery. These so-called barbarians seem to have been practical enough to endeavor to take advantage of these phenomena. Knowing the difference in the results between a malignant and mild outbreak, and that the disease did not generally recur again in the same individual, and that at no time could those that had not been diseased be safe from its ravages, they took advantage of the mild outbreaks and tried to induce the disease, at such times, in every susceptible member of the community.

The first attempts at transference were those most natural to occur to the untutored mind—non diseased persons were obliged (or did it themselves) to wrap the clothing of diseased ones about them, or the scabs were rubbed on the skin, or upon scarified or wounded places. In India, where the history of variolation seems to extend into the misty and indefinite past, it was entirely in the hands of the Brahmin priests, and hence, acquired a very wide extension. They had certain seasons of the year in which they went among the people for this purpose, who were especially prepared for it, by certain known dietetic regulations. The priest then went from hut to hut variolating the people at the door. The point of attack was the outside of the fore or upper arm. The skin was washed thoroughly and then rubbed hard with a dry cloth at the point selected, small incisions being made in it. The virus inoculated with was from the previous year and dried on cotton, which had been saturated from diseased individuals. They never used fresh material. Variolated people were subject to especial hygienic rules for a period of four weeks.

It is said that the danger from this treatment was so small that it was rare that any one died therefrom. It seldom failed to give protection. In Circassia it was resorted to in the early life of the maidens, in order to preserve them from the scars of the natural disease which would render them unsuitable for sale to the lords of the harem.

From Asia, Arabia and Northern Africa, this procedure finally extended to Europe, by the way of Turkey and Greece, but found the most bitter opposition from the physicians of the time, and the clergy, the chief objection raised being that it was trifling with the will of God to take measures to prevent anything which He caused; that small-pox was a punishment of the Lord's for the sins of humanity, and hence justly deserved. (See De Hæn and other writers of the period. Hæser, "History of Medicine." Bohn, "Handbuch de Vaccination," and other works upon small-pox).

Early in the seventeenth century, however, variolation became a "boom" (if I may be allowed a modern expression) in England, which was instigated by a courageous woman, Lady Montague, the wife of the British Ambassador at Constantinople, where she had seen the procedure and learned of its real benefits. On her return to London, in 1717, she had her six-year-old son variolated, and four years later, her only daughter. This venturesome act set all fashionable London in a whirl of excitement, and by order of the king, six persons that had been condemned to die, were pardoned on condition that they would subject themselves to inoculation, and then be exposed to small-pox. This was done, with the most positive and satisfactory results. Soon afterwards, the children of George I were inoculated, and then the treatment became more or less fashionable.

It is only justice to the fair sex to mention that, to a woman also, the Marchioness Buffalini, is due the generalization of variolation in Italy.

Variolation had two historical periods. The one, beginning, as has been shown, in the earliest days of historical record, and extending to the year 1760. This may be called the Crude Empirical period.

The second, which may be called the period of Exact Scientific Observation, began and continued to the demonstration of vaccination by Jenner, May 14, 1796.

If vaccination had its Jenner, so had variolation its Gatti, to whom the world is equally indebted, for it was almost entirely due to the acute observational powers and logical conclusions of this great Italian physician, that variolation itself became an almost safe and equally valuable prophylactic measure to vaccination. Though there seems to have been no historical connection between the work of Gatti and Jenner, still the one did prepare the way for the other, for Gatti demonstrated most conclusively the almost safe prophylactic power of variolation (to the individual inoculated), and hence, his work gave a substantial and practical foundation to vaccination.

Variolation was the first great and successful experiment in the history of pathology, as well as the very foundation of preventive inoculation. It was the first practical demonstration of the fact that non-recurrent diseases could be actually prevented by artificial inoculation; that the art of man could successfully reproduce the work of nature; that, as in nature, a mild attack of non-recurrent disease occurred, so could man, by the transmission of the disease-product, from such a person to a healthy individual, also produce the same mild disease; and, hence, induce in the inoculated individual that same immune condition which nature produced, under similar circumstances.

The name of the real European founder of such a beneficient procedure should not have been allowed to have been so profoundly buried in the archives of medical history. How many American physicians ever heard of the name of Gatti, and yet it should be kept as fresh in memory and crowned as plentifully with laurels of gratitude, as that of the ever immortal Jenner?

Regarding Gatti's relation to variolation, I will take the liberty of quoting directly from Bohn, who says: "No one penetrated more profoundly into the essentials of variolation than Gatti, and no other succeeded as well as he. Gatti is a wonderful phenomenon in the history of medicine in the past century. Nearly every page of his little book on variolation astonishes one by its richness in ideas and its advance over those ruling in medicine at the time. He was a thoroughly unprejudiced and positive observer, sharp and logical in conclusions, with a clever understanding of the nature of pathological experimentation, and knew how to give the correct answer to questions coming before him. One can have but a very superficial idea of variolation in the previous century who has not studied Gatti's work, which is characterized by its clear method, modesty and great humanity."

Gatti's instructions as to the treatment of persons to be inoculated, carry us back to our youthful days, when we had to be prepared for vaccination with cooling salts and other restrictive dietetic measures. He says: "All physicians have said that the persons to be inoculated must be, first, prepared; second, such inoculation-traumata must be made as to allow for a free outflow of the inoculated material; third, as soon as the eruption appears, the patient must be treated with all the care and assistance possible to the physician. On the contrary, I say; patients need no preparation; the physician should never provide for the outflow of the inoculated material by such wounds; and the inoculated person should be left to nature." "To prepare an individual for inoculation is the same as endeavoring to give him a certain predisposition which one considers necessary in order that the inoculated disease shall do him the least possible harm. Is there such a disposition, or can such be produced? We do not know it and hence cannot produce it. Health itself is the best condition, and this alone has one to consider in variolation. An unhealthy person must be first made well before he can be inoculated, but those who are healthy are already prepared for it. Every special preparation on the part of the physician is, however, dangerous. Only those things must be avoided which are liable to interfere with the health. All conceptions as to the preparation of the individual, all endeavors to purify or refresh the blood, or to prevent the inclination of the blood to inflammation, no soul in the world understands, and all endeavors in these directions can only lead to the injury of the individual."

Of inoculation he says: "The material with which we will inoculate must be introduced into the vascular layer of the dermis. The variola virus is so intensive that the most infinitesimal amount is as serviceable as a great mass. It is sufficient, therefore, to simply scratch the epidermis with a needle moistened with the virus, or push it gently for a short distance under the same. This way was first introduced by the inoculators, mostly women, in Greece and Italy, and gave most satisfactory results. Only the physicians have sought to replace this simple and efficacious method by more artificial ones and complicated apparatus."

The barbarism of the physicians of the time cannot be overestimated. Extensive incisions were made in the flesh and the cavity filled with thread saturated in the secretion of diseased persons, or even pieces of their filthy clothing placed therein and held in place by bandages. In other cases, a whole skein of thread would be soaked in such secretions and drawn through the flesh, as a seton. The terrible results and unfortunate complication of such methods can be well appreciated at present, and the value of Gatti to the world better understood now than ever. His motto was, "Inoculate cleanly and delicately, and all after treatment is unnecessary." It is a matter of question if that advice is not as applicable to-day as when he wrote, even with our improved methods of obtaining virus. I have seen physicians vaccinating the poorer class of school children, use the same lancet to scarrify the arm on one after the other, with no attention given to washing the arm, that in many cases were dirty enough. To my mind such a procedure is criminal carelessness, and does much to bring vaccination into evil repute and furnish just and apparently reasonable objections to its opponents. It suffices to say that Gatti's success as a variolator was phenomenal, and that his reputation extended all over Europe. So great did his skill in diagnosis become that he could almost invariably select the correct type of the disease from which to produce the same mild form in the persons inoculated. Very few pustules followed his treatment, and only slight constitutional disturbances in most cases. In fact it is due to Gatti alone that variolation became a reasonably safe procedure between the year 1760 and the introduction of vaccination by Jenner.

Objections to Variolation.—Variolation was not only resorted to as a strictly prophylactic measure, but also that the march of the disease might be hastened, and every one in a community, not previously diseased, might have it at the same time. Variolated persons were, however, as dangerous to healthy ones as those acquiring the disease in the natural manner. They had the small-pox, and hence could be the means of extending it. Therefore, while most extensively practiced, and in many cases made obligatory by law, on the outbreak of small-pox in a locality, still such places were treated as pest-centers, and all communication between them and the surrounding world was shut off until the disease was declared at an end, and the locality cleansed and disinfected, as best they knew how.

The cleverness of these early variolators cannot be overestimated. They insisted that persons to be inoculated be kept by themselves, or from general intercourse with the people for twelve to fourteen days previous to the operation, in order to avoid, as far as possible, the danger of natural infection. They discovered that early childhood was the best time to inoculate, and also that the virus mitigated somewhat in virulence when transmitted from individual to individual. They also paid strict attention to using the clear lymph before the eruption became pustulous, and even collected it in fine glass tubes for conservation. The crusts were also pulverized and so preserved. They found that certain persons were immune towards variolation, about five in one hundred, which, singularly corresponded with the per centage of immunity noticed in natural outbreaks of small-pox. It is easily to be seen that, at the best, variolation was a somewhat dangerous procedure; not only could it extend the disease, but fatality sometimes followed it, per centage being about one to one hundred. Nevertheless, it was a vast advance in prophylaxis, as can readily be seen by comparison with the death rate from the natural disease. Then again, it was found very difficult to exert a proper control over all the inoculated persons, as they were frequently scattered through the community, thus making centers of danger wherever they might be. Notwithstanding all this, there is no doubt but what it proved a great blessing to humanity, and was the means of saving thousands of lives and much misery.

While variolation was forbidden on the Continent of Europe, soon after the discovery of vaccination, it was continued in England until the year 1840, and practiced fully as much as vaccination, when it was also forbidden. It is still practiced, however, among many of the people of Asia and Africa.

Jennerism.—The word "vaccination" is derived from the Latin word "vaccina," of, or from, a cow, and expresses the transference of the disease known as the cow pox, "vaccina," from cows to man. There has been much discussion in the past as to the true nature and origin of cow-pox, without any uniformity of opinion having been arrived at. To my mind it seems as if the observers were almost entirely without ordinary powers of reflection and the ability to draw sequential conclusions. Variola, or small-pox, has been given different names, according to the

species of animals affected, as V. bovina, equina, ovina, and humana. The fact that the inoculation of an animal of a given species, from one of another species, afflicted with the variola common to it, generally protect the first from either natural infection, or the inoculation of the disease common to its species seem never to have been properly appreciated. To my mind it indicates a common origin, and that there is but one variola.

The two malignant forms are those seen in man and sheep, while in cattle and horses the disease has a benign character. Sheep have been protected against variola by vaccination from cattle, and cattle and human beings by ovination from sheep. In fact, ovination of human beings was once looked upon as fully equivalent, in preventive value, to vaccination.

As has been said, these facts of general prophylactic relations between the various variolas, surely indicate but one original form. Whether that point can ever be distinctly decided may be doubtful, but there is no doubt whatever but what we can at once deny all idiopathic attributes to variola in cattle and horses, and emphatically assert that as diseases sui generis they should have no recognition. In fact, in both cattle and horses, variola fails its one essential characteristic. It is not contagious. Transmission by means of the milkers does not constitute contagion!

The transference, inoculation, of either human or ovine variola to cattle through a continued series of these animals, soon mitigates the virulence, so that when again inoculated upon the original species, the contagious factor has been lost. But this is another most valuable pointer in the direction of the original variola. In the days of variolation the most celebrated observers all agreed that the virus of small-pox itself became mitigated on being transferred from man to man through a large number of generations, or individuals. No such phenomenon as this has ever been observed in sheep-pox. It does not lose in virulence in being passed from sheep to sheep. On the contrary, sheep-pox becomes mitigated by transference in all the animals it has been attempted on, man, cattle, rabbits, goats, and horses, but the contrary experiments have never been essayed. Vaccina has never been carried through sheep for a long series of generations, nor has small-pox, nor the eruption in horses. All this demonstrates one fact, that if every other kind of variola loses in virulence, even by transmission in its own species, (using the accepted idea of specific variola) except that of sheep, then the ovine organism provides the most suitable nutrition for the preservation of virulence alone—contagiosity, the human next, while in cattle and equines it is soon lost altogether.

As a matter of experiment, and great pathological interest, it is important to endeavor to build up vaccina to contagiosity again in sheep, if it can be done. It is singular that observers should have looked upon the bovine and equine complications as idiopathic, when in the former it is limited almost entirely to cows, and in both is not a natural contagious disease, only extending by accidental transmission.

It is a matter of absolute certainty that vaccina either owes its origin to the human or ovine disease, most probably the former; and that it was transmitted to cows in past ages in some way by milkers, who also took care of their friends diseased with small-pox, and then the eruption was transmitted in the same way, by the milkers, from cow to cow in a herd, and in this way the disease acquired a constant degree of mitigation—in fact, absolutely lost its virulence, or contagiousness, but still retained the prophylactic principle. Right here let me make a statement which seems to have escaped notice, or expression, at least, and which is of the utmost importance in the study of preventive inoculation: What does this peculiar deportment of vaccina teach?

The very fact that the virulence, contagiousness, of small-pox having been lost in the change from variola to vaccina, shows us that the germs of non-recurrent diseases have the ability to produce two different chemical materials—one pathogenic, the other pro phylactic, and that tests of virulence have no value or control in the question of prevention.

Later on we will return to this question in detail.

It seems never to have been properly appreciated, that there is not on record one single eruption of variola in cattle or horses of a general or epizootic character. As a herd disease, under natural or free conditions, we have no record of it. This again tends to support the hypothesis that the disease in these two species found and finds its origin in the small-pox of man, rather than in the variola of sheep.

Again, as strong proof as can be brought to bear in favor of both these suppositions, and of vaccination itself, is given by the fact that, with the generalization, or compulsion of vaccination, not only has small-pox been brought under most wonderful control, but cow-pox has been almost entirely lost sight of. While there have been cases of small-pox every now and again, and sometimes quite a number in a locality, no one ever hears of a case of cow-pox, and seldom of anything causing a suspicion of the same.

Bohn says, that while vaccination had its Jenner, it was never fortunate enough to have had its Gatti, as did variolation. When I read that passage I could not but think that the worthy German had spoken in ignorance, and that vaccination had indeed had one to take part in its development; one the equal of the great Italian in every respect; one whom we should all delight to honor and to whom this country owes a monument of gratitude, if humanity does to any man, in its development on American soil. I allude to the late Dr. Henry A. Martin, of Boston, the introducer of animal vaccination into this country, a man with more sterling manhood, a more honest brain, and the most comprehensive scholar it has been my fortune to meet among the physicians of this country. In fact, I will go farther, and say, that from the stand-point of a fearless manhood and a devoted and true physician, Henry A. Martin was the only whole man I have yet met in the American medical profession. He was no trimmer; no politician; in fact, he was without policy, as every man should be where truth is concerned. Most physicians in this country are trimmers. They "trim" their professional sails to suit the theological or political breeze, or social conditions. Men are so scarce! Dr. Martin spent a great deal of money trying to find a genuine case of genuine cow-pox in this country, and during his many years of earnest study found but just one. I visited some cases of eruptions in the teats of cows with him, and have been called to many others since, but in none of them has the trouble had any close resemblance to vaccina.

It is the general opinion that Jenner discovered vaccination, and it is for that that he has been honored and credited. Jenner's discovery was the humanization of vaccina; animal vaccination, true vaccination, is of much later origin, and owes more to Martin for its generalization than to any one else, but it is not the exclusive right of any one man. Jenner's method was to take vaccina from accidentally inoculated human beings, and then to pass it indefinitely from person to person. Probably the very crusts, or scabs, used on us in our youth, were direct derivatives of those first originated by Jenner.

That cows had an eruption on their teats which could be conveyed to human beings, and which did prevent small-pox in such individuals, was known long before Jenner's time, seems to be a matter beyond all question. Even that vaccination itself was practiced in England by one Benjamin Jesty, on his own wife and child, in 1774, twenty-two years before Jenner inoculated, is equally true. That vaccina in some way was transmitted to dairy people, and prevented small-pox, was also known to the common people in Germany and other parts of Europe, but no practical use was made of the knowledge. It remained for Jenner to do this. Jenner supplied the exact and trustworthy foundation to a matter of popular belief among a certain class of people, but of which the majority had no knowledge. Jenner's work was thoroughly original. There is not a particle of evidence going to show that he knew anything about the vaccination of human beings by a few others before he attempted it. Not one of those men gave any exact study to the subject, while it is said that Jenner studied, and observed, and weighed all the facts for thirty years, before he attempted to prove his observations and fortify his conclusions by direct experiment on man. This was done on a boy named Phipps, the 14th of May, 1796. But this boy was not vaccinated from a cow, but from one Sara Nilmes, who had been accidently inoculated from a cow, being a dairy-maid. The boy resisted all attempts to transfer small-pox to him by variolation.

It is doubtful if Jenner ever resorted to vaccina itself, that is, to a diseased cow, for his original material, but invariably took his stock from human beings. This should be called Jennerism, or Jennerization.

The one striking peculiarity of this and vaccination, in contradistinction to variolation, is, that the inoculated individual is not contagious to its own species. This is a very striking example of the true meaning of the word "contagion," which, as has been discussed elsewhere, seems to be entirely beyond the comprehension of the medical profession and investigators, with but very few exceptions.

Sycophantic worshippers of Robert Koch, and even the Master himself, are respectfully referred to this example, and asked to ponder a moment that they may learn that contagion and inoculability have no necessary relation, that contagion really means, that the point or locus of the primary origin of the inficiens is a diseased individual.

As has been stated, the very strongest examples of the value of vaccination are not only the very few outbreaks of small-pox which now occur, but also the almost total disappearance of cow-pox among the cattle of those people where any exact control of the question can be looked for. Statistics, as to the value of inoculation, can have but little additional importance, still, a few are appended.

TABLE SHOWING THE EFFECTS OF VACCINATION.[1]

Period of observation.		Place of observation.	Average annual death-rate from variola to the million population.	
Before vac'inat'on	After vac'inat'on		Before vaccination.	After vaccination.
1777–1806	1807–1850	Lower Austria,	2,484	340
" "	" "	Upper " and Salzburg.	1,421	501
" "	" "	Steyermark.	1,052	446
" "	" "	Illyria.	518	244
" "	1838–1850	Triest.	14,046	182
" "	1807– "	Tryat.	911	170
" "	" "	Bohemia.	2,174	215
" "	" "	Austria-Silesia.	5,812	198
" "	" "	Galicia.	1,194	676
" "	" "	Bukovina.	3,527	516
" "	1810– "	Province of East Prussia	3,321	556
1776–1780	1816– "	Poland.	1,911	743
" "	1810– "	Brandenberg.	2,181	181
" "	1816– "	Westphalia.	2,643	114
" "	" "	Rhein-Province.	908	99
1781–1805	1810– "	Berlin.	3,442	176
1780	" "	Pommerania.	1,774	130
1774–1801	" "	Sweden.	2,050	158
1751–1800	1801– "	Copenhagen.	3,128	286

The Utility of Vaccination.—"The deaths from small-pox in Germany, where there is compulsory vaccination, during the years 1887–1888, were 1.8 and 0.8 per million, respectively; while in Austria, where compulsion does not exist, the deaths were 583.7 and 540.4."—*Medical Record*, April 12, 1890.

Vaccination can be very properly termed the use of a natural method of inoculation, even though the virus is now kept up by the artificial transmission of vaccina from calf to calf. It is not the discovery of man. So far as reliable information is at hand, there is no record of the discovery and actual demonstration of the true germ of variola, though the "culture of an artificial vaccine virus, by a Russian physician, which is as effective as the genuine" vaccina, was reported in the issue of January 18, of the *Journal of the American Medical Association*. This assertion must be taken *cum grano salis*, as no mention of such a discovery seems to have been made in any of the special journals of bacteriological research. So far as my memory serves me, nothing but cocci have thus far been discovered in the eruptions of variola or vaccina. I think, when discovered, that the germ of variola will be found to be a very delicate anaërobic bacillus, and spore-bearing at that. Otherwise we cannot account for the long time which clothing, or other material, polluted by small-pox patients, retains its virulence. No non-spore-bearing organism that we now know of retains its virulence for such a length of time under such adverse nutritive conditions. I am also of the opinion that most of the endogenous germs will be found to be anaërobic.

A Few Words as to the Objections to Vaccination.—The opponents of vaccination base their opposition upon the dangers of the transmission of other diseases with which the individual may be afflicted at the time, and from whence the virus has been derived. These objections are more applicable to the transmissions from human beings to human beings than in regard to the use of true vaccina directly. To my mind, however, they will scarcely hold water when we come to consider them critically. Take, for instance, syphilis. If, as is the case, it is at present impossible to positively isolate the germ of that disease, or even to perform auto-inoculation save from a positive syphilitic lesion; if we cannot in any way discover that germ at present—how can it be possible to transmit syphilis from an arm or locus in which there is no syphilitic lesion? It seems to me almost impossible. The same is true of tuberculosis.

[1] Hirsch, Handbuch der Geographischen Pathologie.

The unpleasant complications following vaccination, when scabs were used, or from person to person directly, were due more to some organism which had gained access to the scab from outside, or to the carelessness of the inoculator regarding the cleanliness of his instrument, than to anything else.

The criminally careless manner in which vaccination is done even to-day by too many inoculators, has already been noticed, and is absolutely unpardonable in these days of exact antisepsis and in general scrupulously clean surgery. In such a simple matter as this apparently is, many physicians appear to neglect precautions they deem absolutely necessary in their operations. And yet we even now frequently see erysipelatous or purulent complications follow. If the virus is properly collected, these things should never occur.

More precautions than are now used should be taken in the collection of the virus from calves. Why should all the points and instruments used not be completely sterilized? That they are not, goes beyond question.

The generally favorable results following the use of vaccine points by ordinarily careful physicians shows that the danger of unpleasant complications has been altogether overestimated and magnified by those opposing this valuable prophylaxis. Still, as such does exist, it seems as if some control over these matters should be exercised by law.

The danger of using diseased heifers, especially tuberculotic, need not exist, as I know from a long personal acquaintance with the senior and junior Dr. Martin, where every care is used in collecting the stock. The heifers should be collected some time in advance, and their temperature taken twice a day, and a general observation of their condition practiced. Any animal showing the least departure from normality in any direction, should be peremptorily rejected.

We will now for a moment give our attention to

Pasteurism.—The world owes an unpayable debt to Louis Pasteur, for to him is due, more than to any one else, the reopening of the field of experimental preventive inoculation, and in directions never before thought possible of offering any practical advantages. But even he has not touched upon the most important work, which is the prevention of the non-recurrent diseases of child-life, most especially scarlet fever, which is to-day the greatest scourge that threatens humanity in civilized countries. Pasteur is an explorer in an almost unknown sea of investigation. The "gates" are still but "ajar." They are not yet open. Many others are trying to enter. Some few can glance over the threshold, but the haven of success is yet a long way off.

While I do not accept the results of Pasteur's antirabies inoculation, I most cheerfully credit him with his earnest endeavors and the instructive value of his success in anthrax, hen-cholera and rouget in the hog. It may be well for me to state why I do not believe in Pasteur's method of preventing rabies.

1. There is not a particle of evidence to be found in the long historical record of this disease that it is non-recurrent in character. Not a single case of natural recovery in man or beast has ever been reported where the history of its origin was undoubted and the phenomena presented unquestionable. Hence, we have no natural foundation to warrant the hypothetical possibility of preventive inoculation.

2. Pasteur's statistics are not honest. Not one of those Newark children was ever bitten by a mad dog. Two were left at home, and nine or ten dogs known to have been bitten by the suspected dog were kept confined over three months. Nothing ever happened to them. While the dog was "mad" enough, it was not "rabid." It did not seek to bite any one or thing, but did bite those in its way while running. It was a case of simple frenzy from an unknown cause. Dogs are often attacked thus, without rabies having anything to do with it. Pasteur still keeps those children in his statistics, though he has been fully informed as to the true nature of the case.

3. Pasteurism in connection with rabies has become a regular mania in certain parts of Europe, especially France, and rabies or hydrophobia bears a direct relation thereto. This is easily to be seen by glancing at the statistics of rabies in Prussia, for a series of years; viz.:—

1876–7, 0; 1877–8, 6; 1878–9, 2; 1879–80, 8; 1880–1, 10; 1881–2, 6; 1882–3, 4; 1883–4, 1; 1884–5, 0; 1885–6, 2; 1886–7, 1.

All suspected or rabid dogs in Berlin are brought to the Veterinary School. This includes every dog complained of as having bitten a human being. Of this number rabies has actually resulted:

1878–9, in 5; 1879–80, 1; 1880–1, 11; 1881–2, 3; 1882–3, 1; and none since then up to June 23, 1889, when I received my report. In the whole German Empire there were but five cases of hydrophobia reported in man, in 1886; and but four in 1887.

From 1886 to 1888, there were forty cases of hydrophobia reported in Prussia; and in 1886 and '87, only nine in all in Germany.

Now let us look at the statistics given in Pasteur's Annals.

No. persons treated.	Rabies said to have been demonstrated surely.	Diagnosed by veterinarians.	Suspected.	Total.
Dec., 1888.	45	77	20	142
Jan., 1889.	32	88	22	142
Feb., "	52	90	18	160
March, "	42	95	32	169
April, "	30	122	29	181
May, "	28	149	36	213
June, "	24	115	30	169
July, "	19	111	38	173
Aug., "	15	97	33	145
Sept., "	15	80	16	111
Oct., "	19	88	16	123
Nov., "	20	99	16	135
	341	1211	307	1853

The majority of these cases came from France and the French possessions in Algeria. Does any sane person think that there is this vast difference in the prevalence of rabies in human beings between France and Germany? If so, I am not one of them. If so, no more striking example of the inefficiency of the French Government in comparison to that of Germany in its veterinary police service and guardianship of the public health, can be found.

For three years in Nebraska I vainly tried to obtain possession of an actually rabid dog, and while a vast number of dogs were reported to have been bitten by such, not one would go rabid for me after it had been so bitten. I do not deny the disease. I simply deny its prevalence to any such degree as Pasteur's statistics seem to show. I simply do not believe them.

To show how unreflectingly even educated writers will quote such statistics, the following is taken from the TIMES AND REGISTER, of Philadelphia, April 12, 1889: "Pasteurism in Cuba.—At the Bacteriological Laboratory, in Cuba, three hundred and six persons have been treated by the 'double intensive' plan. Of these, only two died, after going through the full course; a mortality of 1.63 per cent. All

these cases were bitten by dogs proved experimentally and clinically to be rabid, *or at any rate* 'suspect.' That the operations were conducted with due conservatism is indicated by the fact that only three hundred and six were inoculated out of seven hundred applicants. The opposition to Pasteur, if it still exists, has dwindled down to an infinitesimal point."

Even in these cases, not one case was known beyond question to have been bitten by an actually rabid dog, for it is admitted that "at any rate, they were 'suspects'" only. And yet the editor says: "The opposition to Pasteur, if it still exists, has dwindled down to an infinitesimal point." "Three hundred and six" persons, scared half to death on suspicion! They were "suspects" only. We can "suspect" most anything to result from treatment based on such a "suspect" foundation. The foundation of "Pasteur's Institutes" should be treated in a most "suspect" manner. They should be treated as institutions of the utmost danger to the public. Hydrophobia, or Pasteurmania, flourishes in direct proportion to their establishment.

Since my return to this country, from that sensational visit to Pasteur with the Newark boys, a very large number of such "suspects" have come to me, or have been brought to me by physicians, to obtain my opinion as to the desirability of "going to see Pasteur." Fifty-two persons is the number I have on record, but there were a few more, notably three, since I have been in Chicago.

"Mad dogs" were very "suspect," according to the story, in each case. I talked to them calmly, ridiculed their fears, and they all left me apparently comforted. Not one went to Pasteur, and I think it can be safely asserted that no hydrophobia resulted, or I should have heard of it and the papers would have been full of it long ere this. There is a vast difference between a "mad dog" and a genuine "rabid" one. The former are frequent enough, the latter are as scarce as honest original investigators in the United States.

There is still another very strong argument against Pasteur's anti-rabidism. The germ of rabies has not been discovered. This fact in itself is not very strong negatively; but when we take into consideration that rabies is a strictly wound infectious disease in optima forma; or, perhaps better, toxic rather than septic; that, as in tetanus and many forms of surgical toxæmia, the toxic producers remain at the locus traumatica, and that the poisoning of the organism takes place from there, and goes on for some time, and that constantly during that period until a certain cumulation of such material in the nervous centers has taken place—it seems to me that the Pasteur-method is self-evidently absurd. The toxic rabies' element must be in solution (the nervous tissues being only saturated with it); and hence, though very abundant perhaps, still, not in such an excessively concentrated amount, in the small piece of cord used that it can produce the effect claimed. There is altogether too much dilution. If correct in the hypothesis that the toxic producer remains local, there can be no increase in the amount of poison introduced, save as made each day. The fact that the germ remains local indicates that in the trauma is the place to look for it, as in tetanus.

Again, where can I find record of one of Pasteur's artificially rabid dogs ever having conveyed the disease to healthy ones, as is the case in the actual disease, by biting?

These objections may seem too very finely drawn to enthusiastic worshippers of Pasteur, but it may yet be found that they have more foundation than appears on their face.

These objections to Pasteur on one point do not detract, however, from the importance of his work to the world in others, in the least. What may one really call Pasteurism? The answer to this question brings us at once to the consideration of

Artificial Preventive Inoculation, which I will discuss entirely from my own point of view, and base my remarks almost wholly upon my own work and its results. Pasteurism differs as much from Jennerism as does artificial preventive inoculation from vaccination, as practiced at present. Jennerism and vaccination consist in the inoculation of the cause of the disease to be prevented thereby, bound upon or mixed up with the products of the disease; that is, as they are found in its specific lesion at a certain period of its development.

Pasteurism, or artificial preventive inoculation, or even inoculation in the most exact sense of modern experimental etiology, is quite another thing. Instead of introducing the cause mixed up with any products of disease, we isolate it therefrom, cultivate it, and, by one of several methods found suitable, so mitigate the virulent activity of the cause, that we can inoculate without serious danger to the individual thus treated.

It has become a generally accepted fact that all infectious diseases are due to a specific cause, which belongs to some specific species of microscopic vegetable life. The scientific class to which these objects belong is the fungi, their special name being bacteria, or, in common parlance, germs. It is not necessary to go into any description of the various varieties of these germs in an article of this kind; still, it is necessary that we know a little something of the manner of action of that class in which we are momentarily especially interested.

The diseases of animals in which Pasteur has been, beyond question, successful in preventing natural infection by his method of inoculation, the names of which have already been given, and to which may be added swine plague, the yellow fever, and Texas fever in cattle, as well as typhoid fever, are all what are known as forms of septicæmia, or blood poison; the specific poison in each case being the direct result of certain unknown physiologic action on the part of the specific germ, which causes each of these diseases. All these diseases have also another attribute in common, viz.: they are extra-organismal in origin; that is, the place of primary development of the specific germ which causes each of these diseases is outside the animal organism, or in the earth or earthy material.

Though he has never to my knowledge stated it, still I think Pasteur should be credited with recognizing the fact that cow-pox was but mitigated small-pox, rendered, as has been said, non-malignant in character by successive generations of transmission from cow to cow in an accidental and unintentional manner. Pasteur endeavors to do this same thing intelligently. He but repeated the lesson thus learned in his first attempts at mitigating the action of the germs of anthrax, hen-cholera, and rouget by experimental inoculation in various species of animals, and he found that while in some species a given germ acquired even more virulence than it possessed when taken from an animal in which it had caused the natural disease, and kept on increasing in virulence for a time as he passed it from animal to animal of a certain species, still, on the other hand, the same procedure in another species of animal, carried on

through a long series, not only caused the germ to lose in virulence, but after a time they acquired a certain standard of mildness, and could be safely used for inoculation.

This was imitating the results in small-pox. Pasteur went further! Such a method as the above is open to the very serious objection that, not only is an almost unlimited number of experimental animals necessary, but the expense would finally be such as to decidedly interfere with any practical benefits resulting. This led Pasteur and others to seek similar results in entirely different directions. They experimented in many ways, but the continued exposure of artificial culture of given germs to a certain degree of temperature, or their development in from two to two and one-half pressures of oxygen for a certain time, have given the best and most trustworthy results. A most singular fact came from these experiments, which was that when once a certain desired degree of mitigated virulence had been obtained by either of these methods, that cultivation of the same germs could then be carried on in the ordinary room temperature for an indefinite period, each succeeding generation retaining the same degree of mitigated virulence as the previous one and the mother culture. The result has shown that a preventive virus against anthrax, rouget, and hen cholera has been successfully made by these investigators, by one or the other of methods mentioned.

For a very valuable account of Chauveau's experiments in mitigating the virulence of bacillus anthracis in this way, see TIMES AND REGISTER, Philadelphia, April, 1890.

Based largely upon the teachings and work of Pasteur nearly all investigators in this important field of research have been of the idea, and generally are at present, that a preventive virus can be obtained by the simple mitigation of the virulence of a germ of a naturally non-recurrent disease by artificial cultivation under certain conditions of heat, or oxygen pressure, or some other method, so that the introduction of such a culture in a given amount, produces simply a mild and non-fatal form of disease.

The practical results of inoculation, or vaccination, seem to confirm this idea. For myself, I was also of the same opinion, until it was completely shattered by most extensive experiences, and apparently positive experimental results.

It is but justice to myself to inform my colleagues, both investigators and physicians, that this business of "preventive inoculation" in swine-plague is not of my own choosing; that I am bitterly opposed to it; that I feel it is disgraceful in one being, or making any pretensions of being, a scientific investigator; that I think and know that all and every result of original research should be the property of the people; and I can truly say that, had I not the remote hope that the rewards of this distasteful business may be such as to enable me to build, equip, and plentifully endow a laboratory and hospitals for the investigation of the non-recurring diseases of child life, where the poorest genius can have free opportunity to study and be educated, or pursue original investigations, that I would have nothing to do with it. I would not continue it for a moment, to enjoy even a handsome business income, but I hope the end desired may be attained, and that the medical profession will eventually justify the unprofessional means on account of the worth of the object attempted.

Self respect forced me to resign my position as investigator in Nebraska, on account of three years of uninterrupted intrigue, and unlimited abuse and opposition excited against me by the Agricultural Department at Washington. No other course was open to me.

This inoculation against swine-plague is a matter of more importance to the advancement of original research in this country than at first may appear to the casual observer. I can safely assert that so much success has been attained, that it can no longer be open to a single doubt. Its actual practical value can only be estimated by large and extensive experiences continued for several years. Its present value and interest is, however, mainly scientific.

Having sufficiently demonstrated that inoculation will prevent swine-plague, as Pasteur's work has been the initiative incentive to all investigations in this direction, so should this result have the same value in this country, and be a stimulus to the most energetic and exact endeavors to develop protective inoculation against other non-recurrent diseases in our live stock, but even more particularly those of our own species. If my work only succeeds in putting this stimulus in such activity that work will be inaugurated and earnestly continued, and lead to the establishment of National and State laboratories, all that I have labored for will be attained, and my life be pronounced a success. My interest is far more in inspiring and inaugurating true original research in this country, than in my personal success as an investigator. If the last can only lead to the first then I am satisfied.

In this paper I unfortunately can only place before the world my failures, as in justice to my financial supporter I cannot publish the methods by which I have obtained success, much as it is my desire to, but something valuable can, I hope, be learned from my failures.

As has been said, I began the search for preventive inoculation in swine-plague on the principle of mitigation of virulence, so as to obtain a virus that would not seriously disturb the hogs, and yet render them immune from disease.

At this time and place I will simply reassert that this has been done, and in so many places and in so many hundreds of animals, that the fact is beyond the possibility of doubt.

From this non-virulent point of view the first desideratum is to obtain a virus, or culture, of a constant degree of mild virulence. As inferred above, various methods have been empirically discovered. Pasteur, as has been seen, used certain forms of animal life at first, carrying the virus from one to another of a given species in which it slowly lost in virulence until it acquired a desired benignity. He also found that an augmentation of virulence, until it acquired an equal constance in malignity, could be produced in some other species of animals. This was too expensive a method to be practiced. He then found that the exposure of the cultures to a certain degree of heat for a certain time would also produce the desired mitigation. Others have proven these observations to be trustworthy. Chauveau works by the oxygen pressure method, and has obtained the same result. We need not discuss others.

The great fact is that once the desired degree of mitigation has been obtained in any virus, that the virus thus obtained can be then cultivated in ordinary media (fluid) outside of those conditions, and that the virus thus obtained will retain this constant degree of mitigated virulence for a long time. If a spore-bearing germ, this condition may be retained almost indefinitely, but in non-spore-bearing organisms it is not so reliably constant. The first thing, then,

was to obtain a constancy of virulence in the desired direction.

I have never thought that either of the above methods was strictly scientific. They are too artificial; hence, as far as swine-plague is concerned, I have endeavored to produce the same result by a more natural procedure. That is, by chemical nutrition, for this virulence is entirely a physiological-chemical result, and absolutely dependent upon the nutritive qualities of the media in which germs develop. It has been said that, once a desired degree of mitigation was arrived at, it could be retained in artificial cultures for an indefinite period.

With regard to the swine-plague germ, other investigators have not only declared this to be impossible, but also unnecessary. I shall show that it can be successfully done, but cannot, unfortunately, tell how, for reasons previously given. I think I shall also be able to show that, in a certain sense, no great result has been obtained when we have done it.

Attention has been called to the fact that others could not obtain this constancy in mitigated virulence, and, furthermore, that it was unnecessary in swine-plague.

In a paper on "Hog-Cholera," which is the disease I call "Swine-Plague," one of these diletants says: "I shall not go into the details of preventive measures in this paper. * * * What you are doubtless interested in, is the new points which may have been brought out by our investigations. The most interesting of these is our attempt to confer immunity by inoculation. We soon found that there was no indication for attenuating the virus for this purpose, because the strongest virus might be introduced hypodermically, with impunity, in considerable doses. Now, as the stronger a virus is, the higher the degree of immunity it produces, you can see that there is every reason for using fresh unattenuated cultures. We made many experiments, and found that hogs might safely be inoculated with one-quarter to one-half a ccm. for the first dose, and that the second dose might be safely increased to two to three ccms., showing that some degree of immunity had been gained. Those twice inoculated, however, were still unable to stand exposure in an infected pen, and could not be fed the virus without fatal results."—*Journal of Comparative Medicine.* Philadelphia, Pa., April, 1888, Vol. IX, p. 149.

Let us consider these statements a little. First, not only their general tenor, but that of all the subsequent publications of the same author, show, according to him, that swine-plague cannot be prevented by inoculation. It is interesting to read, in this connection, what the same authority said in 1883, five years previous to the above, when, as can be shown, he had no idea what the germ of swine plague was; but, supporting himself on the authority of Pasteur, he asserted a micro-coccus to be that cause. Swine-plague was not discovered in France until 1887.

He said: "Our investigations have shown that the plague is a non recurrent fever, and that the germs might be cultivated; they have even proved that these germs may be made to lose their virulent qualities and produce a mild infection. Surely we have here sufficient evidence to show that a reliable vaccine might be easily prepared if we carried our investigation but a little way farther.

"Mr. Pasteur has recently confirmed (?) our American investigations in a very complete manner. He shows that the disease is produced by a micro-coccus; that it is non-recurrent; that the virus may be attenuated, and protected from subsequent attacks, and he promises a vaccine by spring."—Report Department of Agriculture. 1883, page 57.

That the above was made out of whole cloth is shown by the following:

First. A micro-coccus is not the cause of swine-plague.

Second. The government knew of only one swine-plague until 1886, and a coccus is not the cause of either hog-cholera, or the nondescript disease it now calls swine-plague.

Third. Pasteur studied "rouget," and not swine-plague.

Fourth. A bacillus has been proven to be the cause of "rouget," and not a micro-coccus.

Fifth. Pasteur's virus against rouget does prevent.

Sixth. If in 1883, this person said: "Surely we had sufficient evidence to show that a reliable virus might be easily prepared," what has become of that evidence since then? It is singular that my success in preventive inoculation should dispel it as easily as the morning sun does the fog of the prairie.

As to preventive inoculation in swine-plague I will quote the following only from my address before the Live-Stock Breeders' Association, of Nebraska, February last:

"My only sin has been that I forestalled the ambition of the government, which being one 'for the people,' we might suppose would be an act to receive kind endorsement rather than the most bitter and fanatical opposition.

"Even that 'Board of Inquiry' admitted that inoculated hogs stood the tests they were exposed to better than hogs which had recovered from a natural outbreak.

"Professor Burrill, in a moment of unprejudiced honesty, wrote me that 'none stood the tests so well as the Nebraska hogs.'

"With these facts publicly announced to those most and directly interested, a political neophyte, in a recent publication, claims that he has a letter from the president of that 'Board of Inquiry,' Dr. Shakespeare, in which the latter says that the Nebraska hogs were equally sick, when put in a diseased herd, with a lot of healthy ones also put in the same herd. Then why did not Dr. Shakespeare tell the farmers that in the published report?

"Was it not the sacred duty which he owed to science and to every hog raiser in this country?

"On the contrary, that part of the report to which he had his name attached says, without any reservation whatever, that the Nebraska hogs stood the tests better than those naturally recovered.

"What more then, can you ask?

"Does not that assertion of Dr. Shakespeare's, indorsed by Prof. Burrill's signature, and by his later letter, not only emphasize and confirm the reiterated statement of the government, that the disease is 'non-recurrent?'

"If the inoculated hogs stood the tests better than recovered hogs from a naturally 'non-recurrence' disease, then art beats nature, and inoculation has proven to be a reliable fact, one established beyond question, no matter if an occasional failure does occur, as it has in my practice since I left you, and since I have had to entrust the business to other hands, and, from the very opposition of the government, resort to an undue precaution, which, had I remained here, would never have been necessary."

To the above I add one testimonial from a practical farmer, contributed to the *Breeder's Gazette*, of April 2, 1890:

"Mr. R. C. Fulton, Taylorville, Ill., writes: 'The reports in your issue of March 19, by C. A. Cantine, A. R. Hubbard, Marion Ryman, on inoculation, remind me that it is surely due Dr. F. S. Billings, also the farming world, that I should make report of my experience with two inoculated boars sent me for the purpose of proving, so far as possible, that inoculation is a preventive. The pair of hogs were received about February 8, and at once placed in the lot of about one acre, adjoining which were breeding pens for six sows. In the lot and pens named I had lost forty head of hogs, and yet had a few left when the boars were placed in pens. These hogs have continuously bedded on the same litter, and in the same pen where eight had laid while sick and dying. I have them fed on ear corn only, and that was strewn on the excrement and cleanings from other infected pens, and for drink they have had slough water, which catches the waste of barn, lot and pens above named. This I consider a crucial test, and I felt nothing short of that would satisfy even my unprejudiced mind as to the prevention of swine-plague by inoculation. Many of my neighbors have looked on incredulously, and I was even laughed at by my more verdant ones; but the laugh ceased; incredulity has vanished, and all admit that something prevented, and what else but inoculation? For my herds have been reduced or swept away before. In conclusion, the hogs named are doing fine on the same ground where forty died.'"

Scientifically speaking, this is sufficient evidence to prove the fact.

Now, as to that irresponsible statement that "we soon found that there was no indication for attenuating the virus, because the strongest virus might be induced with impunity in considerable doses."

Whether one ccm. is to be looked upon as a "considerable dose" or not I will not attempt to decide, but that I can select an outbreak of swine-plague from which that dose, in the first generation of cultivation, will produce fatal effects, as well as that inoculation will prevent, is shown by the following:

In December, 1888, I desired to test a number of inoculated hogs for a special purpose. At the State Penitentiary there raged one of the most malignant outbreaks on record. By malignant I mean acutely fatal, not prolonged, and still fatal in its course. From one of these hogs I obtained a culture and inoculated, in the flank, seventeen healthy uninoculated hogs, and twenty inoculated ones, with one ccm. of the first culture, Fifteen of the uninoculated pigs died, and all were sick. The others were not affected at all. Cultures from the original penitentiary hog, and from several of those which died, with full autopsy notes, were sent to Professor Welch, of Johns Hopkins.

This, then, shows that "considerable doses" of the strongest virus cannot be used with impunity, and also that immunity can be produced by mitigated cultures, as none of the inoculated hogs were made seriously ill during their treatment.

The germ of swine-plague varies very much in acuteness of virulence, as every one knows, and this is shown in nearly every outbreak one studies. Rabbits have been considered to be suitable animals to control this point, of which one observer says: "Rabbits die from hog-cholera inoculations in six to nine days." —*Journal Com. Med.*, e. c., p. 133. On this point Welch says: "The duration of life after inoculation of rabbits is usually from five to fourteen days, and it may be even longer."—*Journal Com. Med.*, Vol. I, 1890, p. 52. "Rabbits when inoculated die usually in six to eight days."—*Bulletin, Johns Hopkins University*, December, 1889.

In an attack upon preventive inoculation, made by a tool of the government before the Kansas Board of Agriculture, we find the following interesting passages:

1. "Prevention by inoculation depends upon the well-known principle that one attack of a contagious disease generally protects the individual from the subsequent attacks of that contagion. All individuals, however, are not protected in this way from any disease, and in many cases the protection only lasts for a short period."

Comment is unnecessary.

2. "The dose is not the only factor which must be considered when inoculating. The strength of the virus varies in different outbreaks of the disease so much that the dose, which would be perfectly harmless in one case, would be as certainly fatal in another. As there is no reliable test of the strength of virus, but experiments upon hogs, and as the strength varies during artificial cultivation, you will see that it is next to impossible to accurately know the strength of the virus he (Billings) is using."

3. "Inoculation in practice consists in injecting under the skin as much of the strong virus of hog-cholera as can be safely given without producing a fatal type of disease. It must be remembered that inoculation is very different from vaccination. The virus used in inoculation is the same as is found in hogs dying of the plague, while in vaccination a virus is used so weakened that it cannot cause a fatal disease. No method of vaccination has yet been introduced for hog cholera. It is inoculation that is being advertised as a preventive for hog-cholera, and it is a question of the size of the dose whether the disturbance produced in the hog's body is mild or fatal in character."

From all that has been quoted from these authorities it is evident that they have no idea of a constancy of virulence in the swine-plague bacilli, or that such can be obtained.

It has already been stated that in Pasteur's and other methods of mitigation, when a certain desired degree of mitigated virulence had been once obtained, cultures of the same degree could be then carried on for an indefinite period.

This led me to the study of the following questions:

1. Is there a mitigated or non-fatal degree of virulence to be found in natural outbreaks? or, in other words, can a vaccine virus be at once obtained from a natural outbreak? This I proved to be an unquestionable fact, easy of demonstration at any time, though it took much study and very close observation of the relation of certain pathological lesions to the desired degree of virulence to obtain the knowledge, and some experimentation to prove it.

2. Can this or any natural degree of virulence be retained indefinitely by any method of artificial cultivation by nutritive measures alone?

3. Can this micro-organism be fed up and down in virulence by changes in nutrition alone?

4. Can a direct proportional relation be established between a certain dose of virus of known virulence in small animals and a safe or preventive dose of the same virus in hogs?

The three last questions have all been solved in a most exact and satisfactory manner.

It is possible for me to almost invariably select an outbreak of swine-plague from which a given dose of the first cultivation will kill a rabbit on subcutane-

ous inoculation in approximately four days, and, by a very slight variation in nutrition, to bring and retain such a virus to this point of virulence in a very few generations.

In order to demonstrate this point, I will give the result with several viruses:

VIRUS NO. 1.			VIRUS NO. 2. †		
Generation.	Date of inoculation.	Killing time, days.	Generation.	Date of inoculation.	Killing time, days.
1	Sep. 28 1888.	4	1	Sep. 28, 1888.	4
35	Jan. 5, 1889.	4	77	Oct. 5, 1889.	4
76	Oct. 2, "	5	78	" 13, "	3½
78	" 16, "	4	79	" 16, "	4
79	" 23, "	4	80	" 23, "	3½
80	" 30, "	3½	81	" 30, "	3½
81	Nov. 10, "	4	82	Nov. 10, "	3½
82	" 17, "	3½	83	" 17, "	3½
83	" 25, "	4	84	" 25, "	3⅜
84	Dec. 2, "	4	85	Dec. 4, "	5
85	" 9, "	4	86	" 11, "	3¾
90	Jan. 26, 1890.	4	90	Jan. 10, 1890.	3½
93	Feb. 22, "	3½	95	Feb. 22, "	3½
95	Mar. 9, "	2¾			
98	" 31, "	6*			
99	Apr. 6, "	4			
100	" 13, "	4			
101	" 20, "	4			

*This rabbit had survived a very delicate inoculation, made on 16th of March.

†From an outbreak on another farm.

VIRUS NO. 3.			VIRUS NO. 4.		
Generation.	Date of inoculation.	Killing time, days.	Generation.	Date of inoculation.	Killing time, days.
1	Oct. 2, 1889.	4½	1	Oct. 3, 1889.	3
2	" 9, "	3	2	" 9, "	4
3	" 16, "	3	3	" 16, "	4
4	" 23, "	4	4	" 23, "	4
5	" 30, "	4	5	" 30, "	3⅛
6	Nov. 10, "	3½	6	Nov. 10, "	4
7	" 17, "	3½	7	" 17, "	3
8	" 25, "	4	12	Dec. 24, "	3¾
9	Dec. 4, "	3¾	13	Jan. 1, 1890.	3½
10	" 11, "	3½	16	" 26, "	3½
11	" 18, "	3½	20	Mar. 2, "	3½
15	Jan. 19, 1890.	3½	21	" 9, "	3
19	Feb. 22, "	3⅜	24	" 31, "	3¾

VIRUS NO. 5.			VIRUS NO. 6.		
Generation.	Date of inoculation.	Killing time, days.	Generation.	Date of inoculation.	Killing time, days.
1	Dec. 19, 1889.	2¼	1	Jan 30, 1890.	2¾
2	" 24, "	2½	2	Feb. 2, "	2½
3	Jan, 1, 1890.	4	4	" 22, "	3⅜
4	" 10, "	4	6	Mar. 9, "	4
5	" 19, "	4	9	" 31, "	4
6	" 26, "	4	10	Apr. 6, "	4
8	Feb. 22, "	3½	11	" 13, "	4
13	Mar. 31, "	4½			

From the first generation of this virus No. 5, seven healthy hogs received one cubic centimeter in the inside of the thigh subcutaneously; two of these died, which were closely confined, within ten days; the others were at first loosely confined, and showed no ill effects; but after the fifteenth day they were changed to the closest confinement possible, and all died between the thirtieth and thirty-fifth days; while five others, which were given plenty of room to roam about, and which received the same dose, all lived. This experiment was made to demonstrate, if possible, a certain well-known fact of practical experience.

It has always been told me that if such hogs were shipped, that the death-rate would be checked, or even stopped, while on the cars; and it has also become more or less current among farmers that to put sick hogs on a wagon and rattle them over frozen and rough ground was a good thing to do. In some few cases evil results have followed inoculation. Some few hogs have either died after a prolonged illness or become somewhat stunted; while others, inoculated with the same dose of the same virus, have shown no ill effect. It therefore becomes an interesting question to discover why this should occur in one case, and not in a great many others.

After very careful inquiry it was discovered that, where ill effects followed inoculation, the animals were kept very closely confined, and had not room enough to move around, and that this was the cause; or, in other words, insufficient movement to stimulate the circulation. A very striking example of this occurred in two bunches of hogs inoculated at the same time for a gentleman who is a personal friend and a great advocate of inoculation. At his house were twenty-five hogs in a small pen, while in a field, running with his cattle, were about one hundred and twenty-five others. Those in the small pen had a prolonged and very severe attack of swine-plague in consequence of the inoculation, though none died; while the one hundred and twenty-five in the field showed no ill effects whatever.

Exactly the same thing occurs in typhoid fever in man. The patient has recovered from his typhoid, and the physician congratulates him; the next day he is cyanotic, rapid breathing is present, and pneumonia develops: owing to stagnation of the circulation, and the reflow, or pressure, of the blood to the point of least resistance, which is the lungs.

The above tables show that a standard of virulent activity can be produced in cultivations of the swine-plague germs simply by proper nutrition. They further show that not only the selection of material from a natural outbreak can at once provide a preventive virus; but also that, in successive cultivations for generations, this standard can be retained at a greater degree of virulence than other observers claim to have found in natural outbreaks by their controls in rabbits.

Now I must positively, and against every and any assertion to the contrary, assert that I can prevent swine-plague by inoculation. Were I not bound as I am, I would give records of other viruses possessing no virulence whatever, which have produced and still produce an absolutely immune condition in nearly every hog inoculated.

To discover this fact has cost an immense amount of experimentation and a large amount of money. There is one difficulty about it which cannot be overcome. While the virulence of a culture can accurately be tested on small animals, and the exact relation be established between that virulence and a safe dose in the animals in which a given non-recurrent disease occurs naturally, we have no means of testing the preventive properties of a virus, except the results in inoculated animals of the species in which the disease naturally occurs, and this takes a long time and a great many inoculations.

When I began this work, I thought that a test of virulence, with a proper regulation of the proportional dose, was all that was necessary; now I know that a test of virulence with such proportional control is of no value whatever with reference to the protecting power of a given virus. I know this by an experience in over one thousand five hundred hogs. Either one of the six viruses named above will kill a hog by subcutaneous inoculation in sufficient doses, but more reliably by feeding experiments; yet not a single one of them will protect a hog an iota against the cholera; while a germ virus, without any virulence whatever, even by forced feeding, will protect securely and almost invariably, in single doses of one cubic centimeter.

This assertion is obviously contradictory to all previous experiences, and yet, if one stops to think a moment, supported by the most trustworthy experience which we have.

There is no question that, under certain circumstances, using a natural virus, we must reduce the virulence to a certain degree in order to produce a fatal attack by inoculation; but, on the other side, we do not need to have a virus possessing any virulence whatever to produce immunity in a non-recurrent disease.

Vaccination gives the best possible example of the point we desire to call attention to. While in variolation small-pox itself was transmitted, and the variolated person was as much a source of contagion as one having the natural small-pox, the vaccinated individual is absolutely non-dangerous to those coming in relation therewith.

What has been lost?

Certainly something; and the practical evidence conclusively demonstrates that it must have been, or is, that peculiar element of the germ, the contagion, which rendered the variolated person dangerous while the vaccinated one is not.

It is a question of nutrition only, which can be demonstrated by exact experimentation if we only try.

The bovine organism must offer certain nutritive conditions which, in some unknown way, rob the micro-organismal cause of small-pox of its contagious (small-pox) producing qualities, while the preventive one is retained in optima forma.

The same thing can be done with the germ of swine-plague, but to no such degree of absolute certainty as nature or accident has accomplished in vaccina. While it is the easiest possible matter to feed the germ of swine-plague up and down in virulence, to make it extra malignant, or rob it of that quality altogether by changes in the chemical nutrient, it is a most difficult thing to retain the preventive physiological qualities of these germs. Sometimes it can be done for months, and again they are lost in a few generations; but we have no control over these matters except the practical tests. None of the small animals which I have tried can be easily or successfully rendered immune against swine-plague. Rabbits and guinea-pigs can be rendered somewhat immune by repeated inoculations of small quantities of virus; but, so far, I have been unable to render them absolutely so. Pigeons vary; but no more artificial immunity can be produced in them than they naturally have, as will be shown later, and at another time.

As has been repeatedly mentioned, a test or control of virulence has nothing whatever to do with the protective power of a virus. It simply shows that it is safe to use, and that we can establish the point of safety by experiment.

This shows that we have all been working on an erroneous basis. Prevention has no relation to specific virulence. Others have demonstrated the same fact.

In THE TIMES AND REGISTER, Philadelphia, of April 12 and 19, were published a series of most interesting experiments by Chauveau, the most eminent and conservative experimenter in France, in which he demonstrates it in connection with bacillus anthracis. Chauveau says,[1] that "Energetic vaccinal (preventive) properties have been discovered in a pathogenic germ (B. anthracis) not only attenuated in its virulence, but systematically deprived of all infectious properties—rendered so neutral and inactive that we were forced to ask ourselves if this transformed microbe had not become a new species."

"Cultures of bacillus anthracis in this condition can then be carried on in the ordinary atmosphere."

Chauveau conclusively shows that bacillus anthracis produces two chemical elements in its bio-physiological development; the one toxic, or specifically disease-producing, the other having exclusively preventive properties; and that, by cultivation in two to two and one-half pressures of oxygen, the toxic properties may be, or are, lost, while the preventive are retained. Or, to use his own words, "In fact, in my experiments the vaccine property of the transformed bacillus anthracis is so active, and so well survives the loss of all infectious properties, that we seem authorized to consider these two properties as being absolutely independent of each other, and as each belonging to a special product of microbe life."

Another point in evidence of this fact is this: if we take a culture of the germ of swine-plague which has experimentally been shown to actively possess both of these preventive and toxic, or disease-producing, qualities, by actual experimentation, and freeze it solidly for several days, and then inoculate or feed hogs with it, we will find that, while it has retained its toxic, or disease-producing, properties without mitigation, it has entirely lost its preventive property.

That bacillus anthracis has the power of producing these two essentially different chemical elements has also been well shown by Heuppe and Wood.

Though I sometimes criticise the conclusions of my friend Hueppe, still I think him one of the most competent and reliable patho-bacterlologists living, especially in regard to physiologico-chemical attributes of pathogenic bacteria. In the publication mentioned Hueppe and Wood describe a saprophytic bacillus absolutely without virulent qualities, which, in every method of artificial cultivation, or under the microscope, bore such close resemblance to B. anthracis that it could not be distinguished from that organism. It is a well-known fact that all previous experimenters had not been able to render mice immune to anthrax by any system of preventive inoculation; and yet, with this absolutely non-virulent germ, Heuppe and Wood were successful in rendering these most susceptible animals immune to extremely virulent cultures of bacillus anthracis.

Now, it is neither logical nor reasonable to suppose that this was any other micro-organism than bacillus anthracis. It was derived from the earth possessing exactly the attributes described by these observers. In this case the nutritive conditions in the earth had naturally produced exactly the same physiological-chemical conditions in bacillus anthracis which Chauveau has conclusively demonstrated to be possible of production by the cultivation of the same germ under certain degrees of oxygen pressure, and I have been able to do with the swine-plague germ by chemical nutrition, the only difference being that while I have, as it were, "gone it blind," not being a chemist, and accidentally hit on a means of arriving at a certain practical result by innumerable changes in chemical nutrition, until I have empirically arrived at a method of obtaining a certain result for an uncertain length of time, Chauveau has found a definite means of obtaining it with reference to the bacillus anthracis.

That the chemical nutrition method is the one by which practical results will eventually be obtained goes without question; but it remains for the chemist alone to really discover and perfect it.

[1] The original appeared in *Archives Med. Experimentale*, March, 1889.

The discovery of Hueppe and Wood regarding bacillus anthracis finds its confirmation in many diseases of extra-organismal origin, and explains that heretofore mysterious condition known as "acclimatization" in diseases of this character: such as yellow fever, Southern cattle plague, etc. In these cases the specific germs, in a saprophytic or non-malignant condition, must have gained entrance to the individuals possessing this acclimatization immunity while they possessed this prophylactic power, though not possessing the toxic or disease producing.

That all these exogenous germs are, or can be, changed to saprophytic must be self-evident; and that their toxic or disease-producing property is acquired by peculiar nutritive conditions in the soil which they naturally inhabit seems also equally clear. In fact, their acquisition of disease-producing qualities is dependent upon the prolonged saturation of the ground with the excreta of animal life or the decayed products of animal tissues. The delicacy of the action of these germs in different nutritive media is so little understood, and has enjoyed so little experimentation, especially chemical investigation, that we really know very little about it; yet it is the open field of original research which will eventually lead to success, and from which we can only hope for decidedly practical results.

Why the swine plague virus should lose its virulent properties in cattle, or even when cultivated in sterilized cattle urine, is a question no one can decide at present. Why the germ of the corn fodder disease should not be toxic to animals while still manifesting its presence by specific lesions in green and growing corn, and only become toxic when and after the leaves begin to wither and the chlorophyl suffers chemical changes, are also questions of a nutritive nature which can only be elucidated by the most exact chemical investigations.

At one time in their existence all these organisms are saprophytic, and again they become pathogenically toxic, all of which is determined by the material they develop in.

Before closing, I desire to say a word in relation to fluid cultivating media. When the study of bacteriology first began, these were the only media we had, and it was next to impossible to obtain perfectly pure cultures for the want of a reliable means of isolation. Koch supplied us with this means, but, in doing so, led to an altogether too great neglect of fluid media, which has retarded investigation to a degree not sufficiently estimated by the majority of investigators.

Once it was thought that the only way by which pure cultures could be legitimately attained was by the isolation method offered by the solid media on plates, according to Koch. Now we know that, in the majority of cases, if we inoculate a susceptible animal with material containing a variety of micro-organism derived from an animal having a specific disease, in general, the germ of the latter only will develop; and that, from the specific lesions, we can generally obtain the specific germ in a pure condition if we take the necessary precautions. It is singular that the lesson of this experimental experience has not made more of an impression upon investigators. Why is not the same rule applicable to animals or individuals afflicted with the natural diseases? In other words, why not pathologically decide which is the specific lesion in a given disease, and by experience discover the period in which it is truly specific, and then make cultures directly from it at that time? This point decided, pure fluid cultures can be almost as easily and surely obtained in septicæmic diseases as by recourse to solid media.

In swine-plague, Southern cattle-plague, and the cornstalk disease, all septicæmic in character, I have invariably used fluid cultures in connection with the solid, and with equally successful results as to purity.

The virus No. 1, to which attention has been called, is now in its one hundred and second generation: that is, it has been carried on successfully through about one hundred fluid cultures without one single pollution occurring during all that time. We must resort to fluid cultures if we will be successful in preventive inoculation, for this procedure is one, as well as virulent inoculation, which depends entirely upon the chemical food offered, and only with fluid media can we experiment in that direction or prepare the way for the chemist. Germs which soon lose their virulence on or in solid media retain the same indefinitely in appropriate fluid cultures. Starting with a pure culture, there is no more danger of pollution in the transference from fluid media to the same than in solid media, if one is rapid and dexterous in his manipulations. It is simply a question of strict sterilization and rapid dexterity which gives satisfactory results in either case.

Let me again say that it is only from nutritive experimentation with chemical fluid media that we can arrive at any satisfactory results.

THE REMOVAL OF A DISLOCATED CRYSTALLINE LENS WITH THE AGNEW BIDENT.[1]

By C. B. BLUBAUGH, M.D.,
PARKSBURG, W. VA.

THE crystalline lens, as we know, may be dislocated from disease or violence, or may occur as a congenital condition. It may be only partially dislocated; may swing back and forth, as on a hinge, or may fall entirely back into the vitreous, or be displaced into the anterior chamber; in the latter position it may be extracted by a peripheral corneal cut, though it is best here to use the bident to prevent the lines slipping back through the pupil and into the vitreous. When displaced into the vitreous, we are advised to leave the eye alone, but in following such advice we frequently find, especially in taumatic luxations, that cyclo-choroiditis, hyalitis or detached vetina will ensue, when we are vaguely told to meet these grave complications as the exigencies of the case demand. To remove a dislocated lens from the vitreous, and save the integrity of the eye, is more difficult than any operation in opthalmic surgery, and in describing the bident operation, my best plan will be to cite to you the case which gave birth to the instrument in the fertile brain of the late Dr. C. R. Agnew. It was that of a young man, aged twenty-seven, who had been blind in his right eye from earliest infancy. The form and general appearance of the exterior of the eye were normal, the lens was so loose that it moved to and fro with a quick volatile motion, though suspended on the temporal side by a narrow, hinge-like attachment of the suspensory ligament. Believing that the ordinary methods for the removal of a lens dislocated into the vitreous humor would fail, the procedure which is now offered for consideration was devised. The pupil being first dilated with atropia, the patient was placed on his back and etherized as thoroughly as possible. Wish-

[1] Read before the West Virgina State Medical Society, at Wheeling, W.Va., June, 1890.

ing to have analgesia of the eye, a few drops of a 4 per cent. solution of hydro-chlorate of cocaine were instilled upon the conjunctival surface. The eye-lids were next opened with a Gräfe's speculum and the eye fixed by grasping the tissues between the insertion of the inferior vectus and the margin of the cornea with ordinary fixation forceps. Looking in through the pupil, the dislocated lens could just be discerned lying far to the temporal side of the vitreous chamber in the ciliary region. The bident was now brought into use. It consists of two ordinary, fine, straight, delicately pointed, cataract needles, about six-eighths of an inch long, fixed parallel at a distance a little less than an eighth of an inch apart. These needles are united at their proximal ends by a projection which is flat, and otherwise so shaped and roughened as to be adapted to the grasp of a beak of a holder, such as the Sand's needle-holder. Having mounted the bident in a holder, with the thumb-catch of the latter uppermost, and having the eye-ball firmly fixed, as previously stated, the temporal aspect of the ball was penetrated at a point just far enough to enter the vitreous chamber without wounding the iris or touching the dislocated lens, till the bident had penetrated the vitreous humor to a point a little to the temporal side of its centre, the handle of the holder then being depressed, the points of the bident described an arc forwards, the lens was caught on the bident, as a pea might be lifted on a two-tine fork, and brought forward through the pupil and into the anterior chamber. Then, the bident being pushed on, its points emerged on the nasal side of the eye-ball close behind, but avoiding, the iris. The neat completion of the wound of exit was insured by placing the end of the forefinger of the left hand upon the surface of the eye-ball at the point to which the bident was being directed. In this manner, the scleral conjunctiva being pressed upon the points of the bident, they were passed so quickly through the subconjunctival space, after penetrating the scleratic, as not to let any fluid flow into and distend the subconjunctival connective tissue. The holder was then detached from the bident, and the lens remained free upon its prongs, and pressed against the cornea. A sufficient wound in a downward direction was then made in the cornea, with a narrow Gräfe's knife, and the delivery of the lens easily completed with a delicate wire, or skeleton spoon. The bident was then removed; there was scarcely an appreciable escape of vitreous; the corneal wound fell into neat coaptation and there was no prolapse of iris. The operation was done November 13, and the cure completed December 1.

In my own practice I have had occasion to employ the bident but once. The patient, age forty years, had been struck in the eye with a stone; he was not sent to me for some little time after the accident, when I found the good eye in an irritable condition, and in the injured one the lens was partially in the anterior chamber. I chloroformed the patient, used cocaine locally, and following Dr. Agnew's directions, passed the bident in and pressed the lens into the anterior chamber; made my corneal incision, and with a delicate spoon extracted the lens. Being my first case, I committed the common error of pressing the lens too far forward, thus wedging it in so tightly between the bident behind and the cornea in front that its removal was attended with some little difficulty. I closed both eyes, applying light compresses of absorbent cotton. The second day I removed the dressings and washed the lids thoroughly with a solution of bichloride of mercury, 1 to 2,500, and instilled some in the palpebral slit. I also dropped in the eye a solution of atropia. I pursued this course of treatment, and the recovery of the patient was continuous and uneventful, being discharged cured twelve days after the operation. The modification of the original bident, by Dr. Andrews, of New York, possesses the advantage of having a handle fastened on by a delicate spring, admitting of more nicety of manipulation than where the Sand's needle-holder is used. Some may suggest that the puncture made by the bident in the ciliary region might occasion a sympathetic irritation in the fellow eye; so far this has not been the case and wounds made by the bident have appeared quite unimportant. I am impressed with the idea that where we can detect a fluid vitreous in ordinary cataract extraction, the bident would be of decided advantage in preventing loss of vitreous.

The Polyclinic.

PHILADELPHIA HOSPITAL.

ERNEST LAPLACE, M.D.

METASTATIC EPITHELIOMA.

THE woman who will be brought before you for operation is suffering from metastasis resulting from an epithelioma of the lip. She was operated upon last year, for epithelioma of the lip, and at that time no infiltration of the glands could be detected; but, after the operation, a new cancerous focus was established in the glands of the neck.

By an epithelioma we understand a growth that starts from epithelium. We call the lining membrane of the skin and mucous membrane epithelium. There is another set of cells that resemble epithelium—that grow, as epithelium does, by karyokinesis—and are not found over the surface, but within certain structures, and, in place of being called *epi*-thelium, are called *endo*-thelium. Epithelial cells are flattened, and consist of a nucleus with a mass of protoplasm around it. Any tumor that starts from the epithelium is an epithelioma.

On the other hand, I spoke of another group of cells that is found, not upon the skin and mucous membrane, but in the vessels and glands, and called endothelium. These two kinds of cells, aside from shape and size, proliferate by a splitting up of their nucleus. The nucleus grows larger and contracts in the center into an hour-glass form, and then divides into two parts or nuclei, and the cell then splits into two distinct cells. When all the cells of a part have repeatedly undergone this change we have an epithelioma.

There is a whole mass of glands on the right side of this woman's neck, which are enlarged. An incision is made along the line of the glands, and the mass is found to be very friable. First of all, circumscribe the tumor, and it is an easy matter to attend to the rest. I find this mass to be connected with the masseter muscle, and it is also necessary to denude the maxillary bone. It is almost impossible to avoid cutting the facial artery, and precautions must be taken to see that it is properly ligated. The wound is thoroughly cleansed with antiseptic solution, and ligatures applied after the wound has been painted with a solution of iodoform and ether. Dress antiseptically.

In this case we must be ready for every emergency, for we are working in a very delicate region. A tampon applied for a few moments will stop all oozing

effectually. There is not the slightest objection to applying a sterilized ligature around a vein or artery, and allowing it to remain in the wound. Formerly, bad results from the use of the ligature came from the introduction of germs and septic matter. At present we ligate every important vein and artery without fear. Should we not be able to stop the hemorrhage without a ligature, what should be done? If the patient could not afford to lose any blood, put on the hæmostatic forceps, and allow them to remain for twenty-four hours, and this will check it, with a good deep suture. In this case there is no necessity for this procedure.

In every case where we have used a ten per cent. solution of iodoform and ether after the operation, we have not had a single drop of suppuration.

THE FUNDAMENTAL FACTORS IN THE CAUSATION OF THE INFECTIOUS DISEASES.—1. All toxicogenic germs are dangerous when introduced into the body.

2. Filth may and does breed disease.

3. It is not necessary that milk should contain a specific germ in order to poison a child, or that water should contain Eberth's bacillus in order that it may induce typhoid fever.

4. Wheresoever man builds for himself a habitation and poisons the soil about him and the water which he drinks, with his own excretions, there will be enteric fever.

5. A good digestion and a healthy gastric juice does aid in the prevention of disease.

6. We can still continue to treat consumption by good, generous feeding and constitutional treatment, without the risk of being denounced old fogyish and unscientific in our practice. Such practice is more scientific and more successful than such fads as the rectal administration of hydrogen sulphide gas and inhalation of hot air, which have been imported in recent days from France and Germany.

Our fathers who treated tuberculosis with cod-liver oil and recommended out-door exercise, but who carried no gas bags and knew nothing of the Weigert oven, were not such fools after all.

In conclusion let us state that the germ is only one of the factors in the causation of the infectious diseases. The other factors are to be found in disordered digestion and impoverished blood.

—Vaughan, in *Med. Age.*

TREATMENT OF DIPHTHERIA.—The author has treated in the past two years two hundred and eighty cases of undoubted diphtheria. Six of these cases were complicated with laryngeal diphtheria, and fourteen with nasal diphtheria; about twenty cases were of the severest type, and 45 per cent. of all the cases were below the age of ten years. The treatment consisted of the administration internally of $\frac{1}{10}$ to $\frac{3}{10}$ per cent. solution of thymol, and sometimes also of arac or cognac.

The action of the remedy was rapid, especially in overcoming the tendency to general systemic poisoning. It was given at short intervals (usually five minutes) in doses of five or six drops. In primary laryngeal croup this remedy has three times been successful.

No unpleasant results were at any time observed.

—Gros, trans. in *Annals Gyn. and Pæd.*

ALTERATIVES IN NERVOUS DISEASES.—Each year of my special practice in diseases of the nervous system, I grow more and more convinced that too much stress is placed upon the use of tonics and stimulants therein, and too little reliance upon drugs intended to change blood. There is a distinct limit to the former, for they rapidly lose effect if continued any great length of time, and their number, although large, is not sufficient to keep up a non-ending relay. It is curious how soon toleration of any one of this class of remedies is established up to immense doses, and how long it is before the system recovers so that small ones will have the primary effect. I have a patient upon whom a less dose of compound elixir of cinchona than four ounces is useless, and who only feels that dose pleasantly. Every practitioner has had similar experiences, and has gone through the gamut of tonics only to turn in disgust from the shelf that holds them, in despair of finding something new.

It is in the hope of supplying this need that I wish to call attention to some of my own work in the line of nervous diseases, in which I am interested.

About two years ago, a young lady came from central Maine to me, suffering with an obscure disease of the spinal chord, which had prostrated her nervous system, and made of a strong girl an apparently hopeless invalid. For months she had been unable to help herself from exhaustion, all functions were disturbed, and melancholia threatened.

After a few days' rest, I began the use of central galvanism systematically, and continued it for ten days. At the end of this time, in place of improvement, there was positive loss. She was weaker than at first, and it became evident that something else was called for.

She was then placed in an isolated quiet room, with a trained nurse, and fed with my favorite mixture of equal parts of cream and Valentine's beef juice, a teaspoonful every half hour. At the same time I commenced the administration of iodine, using by preference Gardner's syrup of hydriodic acid in ten-drop doses hourly. I find that this preparation is by far the best form of iodine for rapid dosing, as it is pleasant to taste and rarely, if ever, produces coryza.

In three days the girl showed improvement, and in three more was so much better that seclusion was abandoned and the dietary enlarged to take in some solid food. The iodine was continued in drachm doses of the same syrup four times daily for another week, when Miss B. was on the high road to cure, and had commenced to taste metal plainly.

The iodine was then exchanged for hypophosphates, a half ounce at bedtime. Contrary to usual belief, I find this the most effective way of using this drug. There is a more rapid absorption going on during sleep than in waking hours, and the nervous system is more susceptible to influences of all kinds.

At the end of three weeks of the hypophosphates, accompanied by a diet list of usual proportions, Miss B. was sufficiently well to be permitted to return home, and has since remained in fair health.

The preparation last used was also from the Gardner laboratory, and I am convinced that it is essential to have these compounds pure, a condition that does not exist in every formula on the market.

I have had a bottle of each of these remedies of this make on a shelf in my medicine closet for six months without their undergoing any change, either in color, taste or therapeutical properties, and can recommend them as reliable.

All nervous diseases are either accompanied by, or are the result of, blood change, and will be most successfully treated by such means as will tend to restore the blood to a normal condition, and in my experience these have proven to be alteratives.

—Hutchinson, in *New Engl. Med. Monthly.*

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WILLIAM F. WAUGH, A.M., M.D., Managing Editor.

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IRREGULARS.

THE relations of the irregular schools to the medical profession are attracting considerable attention. In an editorial on Eclecticism, the *Medical Record* discusses the attitude of this sect, and concludes that there is no place for such a special school. Nevertheless, there are in this body practitioners who have the confidence of their fellow-citizens; there are men who have received a thorough medical education; and they have shown the estimation in which they are held by procuring in New York legislation putting them on an equality with the vastly more numerous members of the regular profession. With colleges conducted by educated men, requiring, in one case, a graded course of three years, covering substantially the same ground as the regular colleges, many will ask why eclecticism exists. The sect no longer limits its therapy to the vegetable kingdom; but claims as broad a field for choice as we do. Recognizing that in the regular profession there is the utmost liberty for individual preference, why cannot these men find within our folds all the opportunities they need, without keeping up a separate establishment?

The reason lies in this, that they cannot get into the regular fold, and that the body of their sect—not the head that gives respectability to it, but the great mass—is not so well qualified as to be admitted. The young man who has, unwittingly, entered an eclectic college, has no other resource but to remain an eclectic for life, live in professional isolation, or spend three years in a regular medical college. This is practically a prohibitory tariff; he is a sinner past redemption. To a great many, the three years would be well spent; as their previous collegiate course was of flimsy texture. But here and there we meet with one who does not need such a course; and to whom its exaction would be the waste of a larger section of one's life than any good man can afford to waste. For these it is an injustice to require it. We have already stated our belief that if our doors were opened to this class, there would be an end of eclecticism as a separate school. The truth of this is shown by the uneasiness it has occasioned among eclectics to whom it does not apply. One eclectic journal raises the cry of alarm over it, and loudly demands the upholding of sectarianism. Our memory is not so short but that we recollect seeing the name of that journal's editor upon the list of Buchanan's graduates. It is quite natural he should oppose any movement which would withdraw the worthy eclectics from their unworthy associates.

Give these men a chance to rectify an error into which they fell at a time when they had not acquired such a knowledge of medicine as enabled them to choose wisely. How well qualified is any of our own students to judge when he first enters upon his studies? Did any one of our readers enter the regular profession after a careful examination of its principles and a comparison with the other schools? We have yet to meet the physician who did anything of the sort. We became regulars because our family doctors or preceptors were regulars; or because the university we attended as under graduates had a regular medical department. Why, then, so relentlessly visit upon others the consequences of a choice no more thoughtless than our own? Our proposition is simply this: That the American Medical Association should authorize the colleges to admit to the graduating class practitioners of other schools who have taken complete courses of medical study, and are able to pass the examinations required of our own second course students. It is to be understood that this privilege is to be extended only to those who shall signify their intention to practice medicine regularly, in accordance with the code of ethics of the Association.

Letters to the Editor.

SCREW-WORMS.

CASE I.—In August, 1882, in one of the wards of our County Hospital, I found a man who had been admitted for break-bone fever, contracted in the southern part of Arkansas, from which place he had just arrived.

He told me that he had that morning spit up several worms, which he had preserved to show me. They were screw-worms about three-quarters of an inch long and one-quarter of an inch in diameter. Upon examination, I found the mucous membrane covering the roof of the mouth thickly studded with black dots, which were moving. Applying the forceps, each dot proved to be the head of a screw-worm, and in a short time twenty were removed. Upon further examination they were also found in the nasal cavity, filling both nostrils. I injected a spray of chloroform, and then adjusted a post-nasal douche, using carbolized water, which brought away quite a large number. Ordered douche continued, also a spray to the nasal, post-nasal and pharyngeal walls, which had the effect of removing all within four or five days. During the treatment he called my attention to a small swelling, just anterior to the sterno cleido mastoid muscle, and about an inch below the angle of the inferior maxillary, and said that he thought it contained worms, for he could feel their movements. Upon examination I became convinced that his suspicions were correct, and cutting down upon them, eight or ten were removed, that had evidently bored

their way through the soft tissues of the throat to that situation. After thoroughly disinfecting the cavity, or nest, in which they were found, no further trouble was experienced.

CASE II.—On the 23d of July, 1890, I was called to see Mary Welch, an orphan girl, aged seventeen years, living in a railroad camp, and who was said to be suffering from neuralgia. The right side of her face was very much swollen, eye closed, and suffering intense pain. There was also a very offensive discharge from the right nostril. Upon close examination, with the speculum, to find the cause of the discharge, I was surprised to find a living, moving mass of worms entirely filling the nasal cavity of that side. Ten or twelve were removed with long dressing forceps. I next used a douche of carbolic acid 1 to 1,000, which brought away a few more. Upon examining the mouth I found the pharynx, tonsils, and roof of mouth filled with them, but all under the mucous membrane, where I could not get at them. I saw her once a day, and after removing all worms in sight with forceps, the entire nasal cavity was disinfected by the carbolic acid solution, and then dusted over with iodoform. This treatment had the effect of driving them into the nostrils and into the mouth, and from there they were blown out, or spit out, or removed by forceps.

Treatment was continued four days, removing fifty-seven worms in all, after which patient made a good recovery.

This worm, called the screw-worm, or Texas borer, is from one-half to three-quarters of an inch long and one-quarter of an inch in diameter, pointed on both ends. It is very active in its movements, and the ability displayed in boring into and through the soft tissues of the post-nasal region is marvelous. The body is made up of successive layers or rings, very much resembling a screw, hence their name.

They are the product of the egg of the Texas fly, and are extremely rare in this part of the country, but three cases having come to my knowledge in the past twenty years. It is supposed that the egg is deposited by the fly in the nostril during sleep, from which the worm is developed. This theory is very well supported by my two cases, the one sleeping out doors a great deal, and the other living in an open tent day and night. E. W. FIRGENBAUM, M.D.

EVANSVILLE, ILL.

CORRECTION.

ON page 157 of your journal, you do this institution a great injustice, as no one has "died in the insane department of the Philadelphia Hospital, from scalds accidentally received while bathing." The accident was at another hospital. Will you kindly correct the statement? D. E. HUGHES, M. D.

[The substitution of the definite article for the indefinite was overlooked by the proof-reader, which occasioned the mistake.]

Book Notices.

CYCLOPEDIA OF THE DISEASE OF CHILDREN, Vol. III. Edited by JNO. M. KEATING, M.D. J. B. Lippincott Company.

The third and largest volume of Dr. Keating's great work does not suffer in the least by comparison with the two which preceded it. The scope and magnitude of the Cyclopedia are in themselves conclusive evidence of the fact that the subject "Diseases of Children," is not to be looked upon as a specialty—the limits of its boundary lines being altogether too wide. In the space at my disposal it is impossible to review even briefly all the articles of the volume—a totality of forty-seven. A mere enumeration of them, or, at most, a few general statements must suffice for the majority of the papers, while a small number seem to demand somewhat more elaborate mention.

The subjects discussed are, with a few exceptions, of great practical importance, and were, for the most part, treated with due thoroughness by well-known authorities, some of whom are specialists, handling familiar subjects in their respective domains.

A few of the articles have little more than a scientific interest for the medical practitioner, but this is manifestly unavoidable in a work whose purpose is to convey encyclopedic knowledge. On comparing the illustrations of the present volume with those of Vols. I and II, we find them to be more numerous and, on the whole, superior. The plates of Holt, showing hyperplasia of lymph-nodules, superficial and deep ulcers of colon, acute and chronic catarrhal and croupus inflammations of the small and large intestines, being especially fine. There are about two hundred and fifty figures contained in the present volume, all of which are creditable. We have but a single criticism to offer, and this would apply to all works of similar pretensions, viz., too great division of labor has in many places throughout the book caused needless and excessive repetitions.

In Part I are discussed "Diseases of the Digestive System," and it contains, among others, the following articles: Functional Diseases of the Stomach, by Dr. Wm. Pepper; The Diarrhœal Diseases, Acute and Chronic, by L. Emmett Holt, M.D; Intestinal Bacteria of Children, by Wm. D. Booker, M.D.; Tabes Mesenterica, by A. Jacobi, M.D.; Enlargements of the Liver, by J. H. Musser, M.D.; Contractions of the Liver, by Marcus P. Halfield, M.D.; and Intestinal Obstruction in Children, by W. W. Keen, M.D.

Dr. Pepper's opening paper has the great merit of being practical. We doubt the propriety, however, of describing cyclical vomiting as a distinct condition, since it invariably is merely symtomatic of a great variety of disturbing causes. The excellent article on the Diarrhœa Diseases by Dr. Holt deserves to be widely read, as does also that by Dr. Booker on the Intestinal Bacteria, a subject which is engrossing, and, on account of its practical bearings, deservedly so, a large share of professional attention.

Dr. Musser's discussion of the various conditions and diseases which cause enlargement of the liver is clear and full. This is especially true of the author's treatment of abscess of the liver.

Part II is devoted to "Diseases of the Genito-urinary Organs," and contains not less than thirteen articles. Dr. John F. Goodhart has an excellent paper on "Acute and Chronic Bright's Disease." The author emphasizes the facts that the onset of parenchymatous nephritis may be very insidious, and that "for the diagnosis in such cases thirst may be the guiding light." There is no more praiseworthy article in the whole volume than that by Dr. De Forest Willard on "Malformations of the Penis, Urethra, and Bladder." Every practitioner will readily agree with this writer in stating that "a degree of deformity which would be simply an annoyance, if situated on some other portion of the body, becomes, when associated with the genitalia, so mind-absorbing,

that the individual is rendered morbidly sensitive, and at times becomes almost a sexual monomaniac."

The surgical procedures for the permanent relief of many of these defects are clearly described by one who is, verily, master of his subject. There is a capital chapter on "Diseases of the Blood," by J. P. Crozier Griffith, though it should have found a place in another volume.

Part III—*Surgery*—opens with a worthy introduction by Chas. W. Dulles, M.D., on "Minor Surgery and Emergencies in Children." That portion of the article which deals with emergencies is of great practical value to the practitioner, and especially the author's table, giving the names of most mineral and vegetable poisons and the proper treatment of each.

The subject of "Anæsthesia and Anæsthetics" is ably presented by Dr. O. H. Allis, although it is with great regret we note that his "decided preference in every case, and especially for children, is for that anæsthetic" (chloroform), the author believing this agent to be perfectly safe when rightly administered.

Dr. Thomas R. Neilson introduces Part II (Diseases of the Osseous System and of the Joints) by a good presentation of the subject: "Congenital Abnormalities of the Extremities."

"Club Foot" and "Torticollis" are treated in a satisfactory manner by Drs. E. H. Bradford and E. G. Brackett, and "Fractures and Dislocations," by Dr. J. H. Packard, well-known surgical writers. The last chapter is closed with an article from the pen of Dr. Wm. Barton Hopkins, who discourses learnedly on the subject of "Amputations."

There is certainly much remaining that should be favorably mentioned in the present volume, did space permit; in short, this admirable work should, as it doubtless will, find a place in the library of every truly progressive physician. J. M. A.

Pamphlets.

The Application of Vocal Culture to the Treatment of Throat and Pulmonary Affections. By Eugene L. Crutchfield, M.D., Baltimore, Md. Reprint from *Gaillard's Medical Journal*, August, 1890.

The Medical Digest.

ARNAUDET has made an important contribution towards the study of cancer, as to its contagiousness. He finds that in a Normandy village ratio of deaths from cancer is four times that of Paris. The drinking water is largely drawn from surface ponds, and this is used in the manufacture of cider. The malady developed successively on a line corresponding to the water-supply of these ponds. Such studies could be made in many cases by country doctors.

IS DIABETES CONTAGIOUS?—Schmitz asks the question (*Berlin Klin. Wochensch*), struck by the large number of cases to be found at a thermal station frequented by diabetics. Women in apparent health are often seized suddenly with diabetes, while they are caring for diabetic husbands; even when no heredity can be traced, and no special cause exists. In one case a woman of healthy antecedents married a diabetic. Shortly after his death she was found to be herself affected with glycosuria; but, marrying again, her second husband was soon attacked with diabetes.

FOR OZENA.—

R.—Salol	3ij
Acid. borici	3j
Acid. salicylici	gr. xij
Thymol	gr. v
Talci pulv	3iij

M. S.—To be used as a snuff, alternated with carbolic acid irrigations.

—Cozzolina, in *Prov. Med. Jour.*

CALOMEL AS A DIURETIC.—From the reports thus far presented, we may safely conclude that:

1. Calomel, and in all probability other mercurial compounds, possess diuretic properties.

2. If given in proper dose, the effect of calomel becomes evident in two to ten days. Continuance of the treatment during the diuresis will not alter or increase the effect.

3. Its action is most marked in dropsies due to heart disease. Its action in dropsies of hepatic origin is not to be relied upon. Pathological changes in the kidney prevent or abridge its action.

4. Small doses will prove of no avail.

5. The diuretic action may, in all probability, be ascribed to the irritating effect which the mercury, during its elimination, exercises upon the renal epithelium.—Fackler, in *Jour. Amer. Med. Asso.*

LIPPINCOTT contributes to the *American Journal of Ophthalmology* a paper upon intraocular syringing in cataract extraction, with a report of fifty-three operations. He draws the following conclusions:

"1. The absence, excepting in one case (No. 41), of inflammation or irritation directly referable to the operation, and the absence, also excepting in one case (No. 30), of inflammation from any source serious enough to cause anxiety.

"2. The large proportion of cases in which a high degree of visual acuity was obtained.

"3. The large proportion of cases in which the operation was surgically complete, *i.e.*, in which no capsular opacity remained to be treated by secondary operation. (I make no note of the absence of suppurative inflammation because purulent processes, as remarked by Sattler, Knapp, and others, are of late becoming more and more rare.)

"These advantages I cannot but think attributable in a large degree to the fact of the anterior chamber being so thoroughly cleared of residual cortex."

Speaking of the syringe utilized in these cases he says:

"1. As there is no backward flow, it (the syringe) has no tendency to become septic in use except at the point of the nozzle, and the latter can be readily pulled off and thrown into boiling water or alcohol. If the purity of the other parts of the apparatus is suspected, it is easy to place the reservoir in boiling water, and to replace the old rubber tubing with a new piece.

"2. This instrument can always be depended upon to work smoothly.

"3. It is held like a penholder, and is as easily and securely handled.

"4. As the ejecting force is proportional to the height of the column of liquid, it is of course under absolute control. . . .

"Should a *per saltum* movement be desired, this can be effected . . . by intermittent pressure on the short piston.

"5. It goes without saying that in using this syringe there is no possibility of the entrance of air into the eye."

Medical News and Miscellany.

THE next Congress will be held at Rome, in 1893.

DRUNKENNESS is said to be largely increasing in France.

DETROIT doctors are quarreling over their ability to kill diphtheria germs.

DR. N. SAXMAN, of St. Mary's Hospital, is at Brighton Beach, recuperating.

HEBREW women are almost universally sufferers from uterine and vaginal maladies.

THERE were 355 children sent out last week by the Children's Country Week Association.

DR. GEORGE T. ENGLISH is one of the most popular guests at the Prexton Villa, Cape May.

DR. J. DALLAS ERDMAN, of Macungle, has had his property seized by the Sheriff on an execution.

THE Canadian Medical Association will hold its annual meeting in Toronto, September 9, 10, and 11.

SURGEON-GENERAL JOHN MOORE has been placed on the retired list, by operation of law, on account of age.

IT is stated that small-pox is causing many deaths in the ranks of the Guatemalan army on the Salvadorian frontier.

GRANDON MACREADY, a sixteen-months-old child, was burned with carbolic acid last week, but is reported as improving.

MRS. TILLIE BROWN, at the point of a pistol, rescued a little girl from the hands of a ruffian at Brown's Mills, N. J., last week.

A BERLIN man, bent on self-destruction, found a new way out. He drank a quart bottle of copying ink and blotted out his existence.

NORMAN KERR pronounces hypnotism to be in ninety-nine cases out of a hundred, therapeutically useless and morally dangerous.

DR. J. M. DACOSTA, who was recently the guest of of Mr. and Mrs. George W. Childs, at Elberon, N. J., is now sojourning at Bar Harbor.

M. FILLET DE GRANDMONT has succeeded in restoring the eyelids of a child, by grafts of frogs' skin. The lids had been destroyed by a burn.

PROF. R. VIRCHOW will be three-score and ten years old on October 13. It is proposed to make the event memorable by a banquet and celebration.

DR. G. MILTON BRADFIELD, recorder of the Medical Jurisprudence Society, has lately returned from a trip to Boston, Newport, and Narragansett Pier.

THE Citizens' Passenger Railway Company's stables were destroyed by a severe storm in Philadelphia last week. Six people were killed, and seven injured.

GERMAIN SÈE recommends cannabis Indica for gastric pain. He gives gr. ⅓ of the extract at a dose. This relieves pain, heartburn or epigastric discomfort, without interfering with digestion. The usual treatment, dietetic and medicinal, should also be directed against the causal disease.

THE Trustees of the Camden Methodist Home for the Aged and Infirm have resolved to erect a large home building at Collingswood.

A PHYSICIAN should never idle away his time all day in his office. It's poor practice.

—*Binghamton Leader.*

AN old Indian mound was opened, lately, near Virginia, Ill. It is two hundred feet in length at the base, and one hundred feet broad, by thirty feet in height.

SURGEON WYMAN, of Washington, last week replied to Chief Clerk William P. Troth in relation to the report that yellow fever existed at Port Simon, Costa Rica.

THE threatened legal contest between the Medico-Chirurgical Hospital trustees and adjacent property owners has been amicably settled, both sides making concessions.

A STORY comes from Parkersburg, W. Va., of a snake eight feet long becoming the pet of a family. The said snake answers to his name when called, so the story goes.

THE Senate has agreed to the House amendments to the bill providing for the inspection of meats for exportation. The measure now goes to the President for his signature.

THE new management of the Atlanta *Medical Journal* says it will remove advertisements from among the reading pages. Would that all medical journals would do likewise.

BELLEVUE HOSPITAL MEDICAL COLLEGE and the University Medical College, N. Y., beginning next year, will each require three courses of lectures for graduation. Good.

THE Czar of Russia, it is reported, now employs an American dentist exclusively. And, considering how constantly the Nihilist keeps his teeth on edge, the dentist has no sinecure.

QUITE a sensation has been created in London by the discovery of a case of Asiatic cholera; the patient landed from the steamer Duke of Argyll, which had just returned from Calcutta.

DR. J. H. DOUGLAS, who attended General Grant during his last sickness, has been seized with paralysis, and lies helpless and poverty-stricken at the Presbyterian Hospital, New York.

THE favorite wife of the Shah has been operated upon by Vienna oculists for glaucoma. It is said the consulting Persian physicians who recommended the operation are confined to await the result.

WILLIAM HANLON, one of the famous Hanlon Brothers, had a severe fall from a trapeze in the New York Academy of Music, last week. Drs. Gray and Hallock, of the New York Hospital, attended him.

DR. J. ORNE GREEN says that he has operated upon seventy-eight cases of meningitis from disease of the middle ear. Of these, sixty were cured, three not cured, seven died, two unknown, six unfinished.

A NEW monthly medical journal was issued August 15, at Asheville, N. C., called the *Asheville Medical Review*. Frank T. Merriwether, M. D., and H. Longstreet Taylor, A. M., M. D., are the editors and publishers.

AN epidemic of diphtheria, of the most malignant type, is reported from Chicago, in that portion of the Town of Lake known as "the New City." The section is said to be in bad sanitary condition.

THE Marine Hospital Bureau has been notified of a case of yellow fever on board the Spanish bark Castillo from Cienfuegos via Pencougala, now detained at the Chandeleur Quarantine Station, Mississippi.

OFFICIALS of the Chicago Infirmary have discovered that bodies of paupers buried in the lot belonging to the institution have been disinterred and sold to medical schools for dissection, and that the business has been carried on for a long time.

THE announcement was made that twenty car loads, or 20,000 watermelons, from Charlestown, Mo., were to be auctioned in New York last Monday, and it is believed that speculators with a car load of paregoric were in pursuit of the train load of bombs.

MAYOR FITLER last week sent the balance of the fund for the entertainment of the Pan-American Congress, amounting to $204.22, to the Southern Home for Friendless Children. This was done after the wishes of the subscribers to the fund had been consulted. The total amount of the fund was $3,900.

DR. WILLIAM RICE last week filed his statement in the case against the Philadelphia *Inquirer* to recover $10,000 damages on account of a publication made in the *Inquirer* on November 13 last and circulated. Dr. Rice alleges that the charges made in the article are untrue, and the publicity given them by the paper has seriously injured his good name, fame, and reputation.

CHICAGO POLYCLINIC.—The following appointments have been made: Drs. G. Fütterer, F. C. Hotz, and E. Fletcher Ingals, Professors of Internal Medicine, Ophthalmology, and Laryngology, respectively. Drs. Chas. F. Stillman, P. S. Hayes, and J. M. Patton, Associate Professors of Orthopædic Surgery, Electro-Therapeutics, and Medicine, respectively.

LONDON, Aug. 15.—The Government of India reports that the medical authorities are unable to agree as to whether leprosy is contagious or not. The local governments also differ on the question. The proposed legislation will therefore be postponed until full details have been collected through the National Leprosy Fund in conjunction with a medical commission, which will leave England in October.

THE Coroner's jury in the case of Frederick Schroeder, who was thought to have been murdered by James Hall, at Morrisville, this State, last Monday week, concluded its testimony, and returned a verdict that Schroeder died from paralysis of the heart. The most important testimony was that of Dr. William E. Case, of Morrisville; Dr. George H. Stroup, of Eddington, and Dr. A. S. Wilson, of Bristol.

THE annual meeting of the American Social Science Association will be held in Saratoga in the week beginning September 1. Several Philadelphians belong and will attend the sessions. Dr. H. L. Wayland reads a paper on Laissez-faire Run Mad, and Dr. W. B. Atkinson, Secretary of the Pennsylvania State Medical Association, will talk about Infants and Children and Their Food. Most of the economists of the country will be in attendance; Profs. James and Thompson, of the Uuniversity, among them.

DR. ALBERT SHAW, who recently contributed a striking article on Glassgow in *The Century*, is to write a series of papers for that magazine during the coming year, on "Municipal Government in Europe and America."

A DETROIT man who drank a quart of embalming fluid in mistake for liquor, became as rigid and as white as marble half an hour before death, and when death came finally he looked more like a mummy than a corpse.

DR. SIMON N. PATTEN, Professor of Political Economy at the University of Pennsylvania, has been gathering vigor abroad this summer. At last accounts he was in Switzerland, and writes that he has bought a pair of seven-pound hop-nailed shoes for tramping over the Alps.

A BOY cured of a dislocated neck is the prize case of the Presbyterian Hospital. The patient is so well mended that he does not have to wear a support to hold his head up. There have been broken necks mended, but few, if any, so well as this. The patient is Harry Reigel, fourteen years old, 511 North Forty-first street. He was attended by Dr. De Forrest Willard and Dr. Wm. C. Posey, a rising young physician.

FROM Tuesday to Thursday, it is reported there were twenty-eight deaths from cholera and forty-eight fresh cases of the disease at Eltor, in Egypt.

The dreaded disease seems to be steadily spreading along the Mediterranean coast of Spain, as well as into the interior of New Castile, where both Madrid and Toledo are more or less infected. Persistent rumors come of its appearance in the South of France, all of which, however, are denied vigorously, and the authorities are now watching suspicious cases at Liebenwalde, near Berlin.

THE increasing popularity of the idea of the revival of the apprenticeship system received a curious illustration in the suggestion made by Mr. Lawson Tait, President of the Mason College, Birmingham, before the meeting of the Medical Congress. In considering the training essential for the craft of surgery the speaker cordially recommended the restoration of the apprenticeship system for medical and surgical students. He believed that an art like surgery cannot be acquired by passing examinations, but that other qualities are needed by the surgeon than simply knowledge derived through books and the training of schools.

THE ANGLO-AMERICAN DINNER.—One of the social incidents at the Berlin Congress was the Anglo-American dinner, given by a few hospitably disposed Englishmen and Americans to friends of both nations at the Kaiserhof Hotel, on Friday last, with Dr. J. V. Shoemaker, the well-known therapeutist, of Philadelphia, in the chair. Upward of sixty representative medical men were present, including Dr. Landolt, of Paris; Profs. Pancoast and Goodman, Philadelphia; Dr. Wm. Murrell, London; Prof. Leech, Manchester; Dr. Parkes, U.S.A., etc., and in addition, the editor of the German *Pharmaceutical Times;* Mr. Burroughs, London; Mr. Evans, Philadelphia, and other well-known pharmacists were present. Although the arrangements were seriously interfered with by the delay entailed by the return of many of the guests from the Imperial reception at Potsdam, a thoroughly agreeable evening was spent by the company, most of whom only meet triennially on the occasion of these congresses.—*Med. Press.*

NEW PATENTS:—

PATENTS GRANTED AUGUST 19, 1890.

Dental Engine	A. W. Browne	Prince's Bay, N. Y.
Hand-Piece Pulley-Head for Dental Engines	A. W. Browne	Prince's Bay, N. Y.
Dentist's Mixing-Slab	L. Teal	Philadelphia, Pa.
Blue Die	A. Weinberg	Frankfort-on-the-Main, Germany.
Lotion	F. Schmidt	Brooklyn, N. Y.

TRADE-MARKS ISSUED AUGUST 19, 1890.

Bitters (The word "Sioux")	E. Lassig Co	Goodwin, S. D.
Perfumery, toilet-waters, soap, sachet-powders and smelling-salts (The word "Opal")	Ladd & Coffin	New York, N. Y.
Tooth-powder (The word "Ambrosial")	F. A. Ewer	New York, N. Y.
Antibacterials, aseptics, and antiseptics, and antizymotics (The word "Pyoktanin")	E. Merck	New York, N. Y.
Toilet lotions (The words "Diaphanous, Antephelis, Antiwrinkle Lotion")	M. J. Pinault	Boston, Mass.
Hair-restorative (The word "Champion" and a portrait of Mary M. Snyder)	M. M. Snyder & Co.	Creston, West Va.
Liniment (The word "Magic," with two circles surmounted by an American eagle)	L. Conrad	Elizabeth, N. J.
Mineral water (The word "Nee-Ska-Rae")	Nee-Ska-Rae Mineral Spring Co	Milwaukee, Wis.

LABELS REGISTERED AUGUST 19, 1890.

"Marshmallow Cream"	The Diamond Laboratory Co	Naugatuck, Conn.
"Youngkin Brothers Screw-Worm Exterminator"	J. A. and J. S. Youngkin	Sweet Home, Tex.

—Charles J. Gooch, *Patent Attorney.*

LOCK BOX 76, WASHINGTON, D. C.

INTERMENTS in Philadelphia, from August 16–23, 1890:

CAUSES OF DEATH.	Adults.	Minors.	CAUSES OF DEATH.	Adults.	Minors.
Abscess of brain		1	Fever, typhoid	9	2
" " groin	1		Fracture of skull	1	
Alcoholism	2		Gangrene, senile	1	
Apoplexy	9		Inflammation brain	2	9
Bright's disease	8	1	" bronchi		2
Burns and scalds	4	1	" bladder	1	
Cancer, stomach	4		" kidneys	3	1
" uterus	1		" liver	1	
" face	1		" lungs	6	14
" liver	2		" pericar'm	1	
Caries of the spine	1		" periton'm	3	
Casualties	6	1	" s. & bowels	7	4
Congestion of the brain		1	" spine	1	
" " lungs	1	1	Insanity	1	
Cholera infantum		39	Inanition		15
" morbus	1	1	Marasmus		28
Cirrhosis of the liver	1	1	Old age	10	
Consumption of the lungs	44	9	Obstruction of the bowels	2	1
Convulsions	1	21	Paralysis	6	
" puerperal	1		Poisoning, ammonia	1	
Croup		3	Pyemia	1	1
Cyanosis		7	Rheumatism	1	
Drowned	3	3	Septicæmia	2	
Debility	5	2	Softening of the brain	1	
Diarrhœa		5	Suffocation		1
Diphtheria		8	Suicide, corrosive sublimate	1	
Disease of the hip		1	" drowning	1	
" " heart	24	4	" hanging	2	
" " liver	1		Tabes mesenterica		1
Dysentery	2	4	Teething		1
Dropsy, of the brain		3	Tetanus		1
Embolism, cerebral	1		Tumor, brain		1
Enlargement of the heart	2		" abdominal	1	
Emphysema	1		Ulceration of the stomach	2	
Fatty degener. of the heart	2		Uræmia	3	
Fever, gastric		2	Whooping-cough		9
" malarial	1	2			
" scarlet		3	Total	201	214

THE Government physicians, of Madrid, have announced their refusal to serve any longer in the cholera infected districts unless they are given a strong military escort. They declare that the peasants are opposing all attempts to institute sanitary precautions, and even resort to force in order to prevent them from doing their duty, and that under these circumstances any abatement in the virulence of the disease is quite impossible. The city of Argos has been deserted by all the inhabitants, only those who are down with the cholera and a few relatives who refuse to desert them being left.

THE trustees of the Helen Prideaux Memorial Fund have awarded the prize to Miss Adela McCulloch Knight, M.B. Lond., the Australian lady now Resident Medical Officer at the New Hospital for Women, Euston Road, who studied at the London School of Medicine for Women.

TO CONTRIBUTORS AND CORRSEPONDENTS.

ALL articles to be published under the head of original matter must be contributed to this journal alone, to insure their acceptance; each article must be accompanied by a note stating the conditions under which the author desires its insertion, and whether he wishes any reprints of the same.

Letters and communications, whether intended for publication or not, must contain the writer's name and address, not necessarily for publication, however. Letters asking for information will be answered privately or through the columns of the journal, according to their nature and the wish of the writers.

The secretaries of the various medical societies will confer a favor by sending us the dates of meetings, orders of exercises, and other matters of special interest connected therewith. Notifications, news, clippings, and marked newspaper items, relating to medical matters, personal, scientific, or public, will be thankfully received and published as space allows.

Address all communications to 1725 Arch Street.

Army, Navy & Marine Hospital Service.

Official List of Changes in the Stations and Duties of Officers serving in the Medical Department, U. S. Army, from July 28, 1890, to August 23, 1890.

By direction of the Acting Secretary of War, leave of absence for one month and fifteen days, to take effect about August 15, 1890, is granted Major Daniel G. Caldwell, Surgeon. S. O. 176, par. 1, A. G. O., July 30, 1890, Washington, D. C.

By direction of the Acting Secretary of War, Captain William Stephenson, Assistant-Surgeon, now on duty at Columbus Barracks, Ohio, is assigned to temporary duty at Jefferson Barracks, Missouri, during the absence on leave of Daniel G. Caldwell, Surgeon, and will report accordingly. On the return to duty of Major Caldwell, Captain Stephenson will rejoin his proper station. S. O. 176, par. 2, A. G. O., July 30, 1890, Washington, D. C.

PROMOTION.

To be Assistant-Surgeon, with the rank of Captain after five years' service, in accordance with the act of June 23, 1874: Assistant-Surgeon Francis J. Ives, July 25, 1890. Headquarters of the Army, A. G. O., Washington, August 11, 1890.

To be Assistant-Surgeon, with rank of Captain after five years' service, from August 12, 1890, First Lieutenant and Assistant-Surgeon Wm. P. Kendall. Headquarters of the Army, A. G. O., Washington, August 18, 1890.

The leave of absence for seven days granted Captain George McCreary, Assistant-Surgeon, by Orders No. 84, Fort Warren, Mass, August 13, 1890, is hereby extended fifteen days. S. O. 193, Headquarters Division of the Atlantic, Governor's Island, New York City, August 15, 1890.

By direction of the Acting Secretary of War, the retirement from active service, this date, by operation of law, of Brigadier-General John Moore, Surgeon-General, U. S. Army, under the provisions of the Act of Congress approved June 30, 1882, is announced. General Moore will repair to his home, Bloomington, Indiana. S. O. 191, par. 2, A. G. O., Washington, D. C., August 16, 1890.

By direction of the Acting Secretary of War, First Lieutenant Charles F. Mason, Assistant-Surgeon, is relieved from further temporary duty at Fort Logan, Colorado, and will report for duty at his proper station (Fort Washakie, Wyoming). S. O. 191, par. 3, A. G. O., Washington, D. C., August 16, 1890.

By direction of the Acting Secretary of War, a board of medical officers, to consist of Major Joseph V. D. Middleton, Surgeon; Major Clarence Ewen, Surgeon; Captain William E. Hopkins, Assistant-Surgeon, will assemble at the U. S. Military Academy, West Point, New York, at 11 o'clock, A.M., August 27, 1890, or as soon thereafter as practicable, to examine into the physical qualifications of the candidates for admission to the Academy. S. O. 192, par. 1, Washington, D.C., A. G. O., August 18, 1890.

With the approval of the Acting Secretary of War, leave of absence for four months, to take effect about September 1, 1890, is granted Captain Walter Reed, Assistant-Surgeon. S. O. 192, par. 17, A. G. O., Washington, D. C., August 18, 1890.

RETIREMENT.

MOORE, JOHN, Brigadier-General and Surgeon-General, August 16, 1890 (Act of June 30, 1882). Headquarters of the Army, A. G. O., Washington, August 18, 1890.

Medical Index.

A weekly list of the more important and practical articles appearing in the contemporary foreign and domestic medical journals.

Extra-neural nervous disease, Hughes. Alienist and Neurol.
Erkrankungen des Magen-Darmtraktus, Blutkrankheiten. Deutsche Med.-Ztg.
Erysipela infectieux et pneumonie erysipelateuse, Cerne. La Normandie Médicale.
Estudio terapeutico sobre la fenacetina, Sinforiano. Rev. Clin.
Ein Beitrag z. Ætiologie d. Eiterung, Kapper. Wien. M. Pr.
Functional nervous diseases of reflex origin, Baker. Journal Amer. Med. Ass'n.
Feeding in the wasting diseases, Cutter. *Ibid.*
Fractures of the maxillæ, treatment of, Gibson. Dent. Cosm.
Five surgical cases of somewhat exceptional interest, Powers. Medical News.
Facial expression of cerebral, multiple cerebro-spinal, sclerosis, notes on, Hughes. Alienist and Neurol.
Food adulteration and meat poisoning, Newton. Sanitarian.
Gross anatomy of chronic pulmonary consumption in relation to diagnosis and prognosis, Roosevelt. N. Y. Med. Jour.
Gastro-intestinal irritation, with report of cases, Allen. Kansas City Med. Record.
Gastro-enterostomy for pyloric carcinoma, Jessett. Lancet.
Gargling, its proper method and sphere of usefulness, Swain. Med. Record.
Hypertrophy of the prostate gland, addition to McGuire's Operation, Morris. N. Y. Med. Jour.
Hysterectomy for œdematous fibroid, recovery, Douglas. *Ibid.*
Hysterical aphonia, or paralysis of the crico-arytenoid muscles, Ingals. Jour. Amer. Med. Ass'n.
Hydrotherapie bei chronischer Rückenmarksentzündung, Florian. Deutsche Med.-Ztg.
Hereditary criminality, *vs.* educat., McClelland. Med.-Leg. J.
Hamamelis virginica, Spees. Cin. Lancet-Clinic.
Heilung eines grossen Senkungsabscesses nach Rippencaries durch Iodoforminjectionen, Kerschner. Prager Med. Woch.
Hematocele pelvienne intra-peritonale, Pozzi. Bulletin Méd.
Hypnotism, Funkhouser. The Alienist and Neurol.
Hypnotic state of hysteria, Krauss. Jour. Nerv. Ment. Dis.
Injuries of the hip and absorption of the neck of the femur, Vance. N. Y. Med. Jour.
Intra-ligamentary ovarian cyst successfully treated with iodine injections. Rhett. *Ibid.*
Impacted urethral calcul. in boy of three years, Crandall. *Ib.*
Influenza u. Augenerkrankungen, Greeff. Berl. Klin. Woch.
Infl. dystrophique de l'heredo-syphilis, Fournier. La Méd. M.
Injuries to the head, Battle. British Med. Jour.; Lancet.
Invaginat. of the intestines, Robinson. Tol. Med. Surg. Rep.
Infant prodigy, Clevenger. Alienist and Neurol.
Insular sclerosis, in which an attack of cerebral hemorrhage arrested the tremor on the hemiplegic side, Sinkler. Jour. Nerv. and Mental Diseases.
Iridescent vision in glaucoma, Collins. Ophthal. Rev.
Influenza in Massachusetts, Shattuck. Bost. Med. Surg. Jour.
Klinische Beobachtungen über die Resistenz der rothen Blutkörperchen und die Isotonieverhältnisse des Blutserums bei Krankheiten, Limbeck. Prager Med. Wochenschrift.
Left inguinal colotomy, with remarks on other operations, Gaston. Jour. Amer. Med. Ass'n.
Le jambul, Egasse. Bulletin Gén. de Therap.
La circulation et le rôle des hydro-carbones dans l'organisme, à propos du diabete, Arnaud. La Trib. Méd.
L'influenza e le malattie nervose e mentali, Lojacono. Rif. M.
Lupus primitif de la gorge, Moussons. J. de Méd. de Bord.
Local and general peritonitis, treatment of, Davis. Cin. M. J.
Leçons sur un cas de maladie des tics et un cas de tremblement singulier de la tête et des membres gauches, Grasset. Archive de Neurol.
La tuberc., la vaccine et le vaccin de chèvre. G. M. de Nantes.
Laudry's paralysis, contribution to the study of, Preston. The Alienist and Neurologist.
Les microbes de la grippe, Critzmann. La Méd. Mod.
La sarcinosis, su tratamienio por el lavado del estomago con el sulf. y el bisulfito de sosa, Jacobo. Rev. Clin. de los Hosp.
Mrs. Abbott, the Georgia magn. woman, Smith. Am. Pract.
Menthol in diseases of the air-passages, Bishop. Med. News.
Management of lacerated perineum, Beattie. Kansas C. M. R.
Micro-organisms in relation to the production of disease, Wade. South. Cal. Pract.
Multiple neuritis, Funkhouser. The Alienist and Neurol.
Mental symptoms of phthisis, Kiernau. *Ibid.*
Motor hallucinations, Tamburini. *Ibid.*
Medals, Jeton's, and tokens illustrative of sanitation, Storer. The Sanitarian.
Meningite simple survenant pendant la convalescence d'une fièvre typhoïde et evolaunt à la manière d'une meningite tuberculeuse, Tordeus. Jour. de Méd.
Malignant endocarditis, Stedman. Bost. Med. and Surg. Jour.
Malignant endocarditis secondary to colitis, Shattuck. *Ibid.*
Notiz z. Chemie d. Samens, Posner. Central. f. d. Med. Wiss.
Notizen über die Denguefieber-Epidemie und die Influenza. Epidemie zu Smyrna, Diamantopulos. Wien. Med. Presse.
Nephrolithotomy, Keetley. British Med. Jour.
New aural probe, Cousins. Med. Press.
Nuovo metodo di colorazione doppia, carminio e picronigrosina, Pianese. La Rif. Med.
Nota clin. sulle psicosi consecutive all' influenza, Cristiani. *Ib.*
Note sur un cas de folie-choreique, Regis. J. de Méd. de Bord.
Neuric and electric forces, Schilling. Alienist and Neurol.
New method of obtaining small quantities of stomach contents for diagnostic purposes, Einhorn. Med. Record.
Origin and evolution of the face, Thompson. Dental Cosmos.
Observations sur les cysticerques du tænia saginata ou inermis humain dans les muscles du veau et du bœuf, Laboulbeue. Bulletin de l'Acad. de Méd.
Œdema of the lungs in partur. women, Bissell. N.-W. Lanc.
Osmosis of strychnia through organic tissues, Miller. M.-L. J.
Observations on treatment of pernicious anæmia, based on a study of its causation, notes of a case, Hunter. Brit. M. J.
Primary broncho-pneumonia, acute, with low temperature and other obscure symptoms, Holt. N. Y. Med. Jour.
Persistent vomiting, with history of chylous (?) vomiting, relieved by laparotomy, Buckmaster. *Ibid.*
Prolapsus of the anterior vaginal wall, new operations for, Currier. Jour. Amer. Med. Ass'n.
Pelvic and abdominal surgery, recent cases in, McMurty. The Med. Progress.
Psychosen nach Influenza, von Holst. Berl. Klin. Wochen.
Puerperal eclamysia, treatment, seven cases, Poe. Omaha Cl.
Primera ovariotomia practicada en Puerto Rico, Stahl. Cron.
Prolapsus or procidentia of the rectum, McLeod. Lancet.
Progress of sanitation in South India, Roe. Brit. Med. Jour.
Porvo-Cæsarean operation, Cadge. *Ibid.*
Poisoning by mussels, Cameron. *Ibid.*
Paralisi nucleari dei muscoli degli occhi. La Rif. Med.
Pulmonary tuberculosis, treatment of, Wells. Northw. Lanc.
Pathology of tuberculosis, Stewart. *Ibid.*
Poisoning by the use of sulphate of atropia in process of tooth-stopping, Cantli. Med. Press.
Plea for early operative interference in acute peritonitis, with reference to idiopathic peritonitis in children, Lydston. Archives of Pediatrics.
Prudential hæmatocele, Thompson. St. Joseph Med. Herald.
Peritonite tuberculeuse aigue, Tordeus. Jour. de Méd., de Chirurgie et de Pharmacie.
Peritonitis, new treatment of, Lanphear. L. Kan. C. M. Ind.
Pulmonary tumors, McKee. Alabama Med. and Surg. Age.
Paths of secondary degeneration in a case of injury of the cervical spine, Meigs. Amer. Jour. Med. Sciences.
Peri-typhlitic abscess, Groves. Montreal Med. Jour.
Pathology of hay-fever, Berkart. Lancet.
Pathology and treatment of typhus abdominalis or enteric fever, Nothnagel. Med. Press.
Prolapse of the ovary, Duke. *Ibid.*
Posterior hypertrophies of the middle and inferior turbinated bones, Allen. University Med. Magazine.
Prevention of pulmonary consumption, Kretzschmar. Brooklyn Med. Journal.
Predisposition to pulmonary phthisis and the prophylactic value of pulmonary gymnastics, Evans. *Ibid.*
Pseudo-membranous laryngitis by mercurial fumigation, treatment of, Law. *Ibid.*
Public hospitals of Brooklyn, Pilcher. *Ibid.*
Physiological and therapeut. action of sulphur, Shoemaker.
Paranoia, case of, illustrating the feature of imperative conceptions, Diller. The Alienist and Neurologist.
Poly-neuritis, form of, probably analagous to or identical with beri-beri occurring with sea-faring men in northern latitudes, Putnam. Jour. Nerv. and Mental Diseases.
Pouvoir antiseptique des couleurs d'aniline et leur emploi en therapeutique, Sée et Morau. La Med. Mod.
Perineal preservat. dur. labor, Cunningham. Week. M. Rev.
Peri-typhilitis, Homaus. Boston Med. and Surg. Jour.
Rickets, West. Cleveland Med. Gaz.
Repair of lacerated perineum, new operation for, Duke. Amer. Pract. and News.

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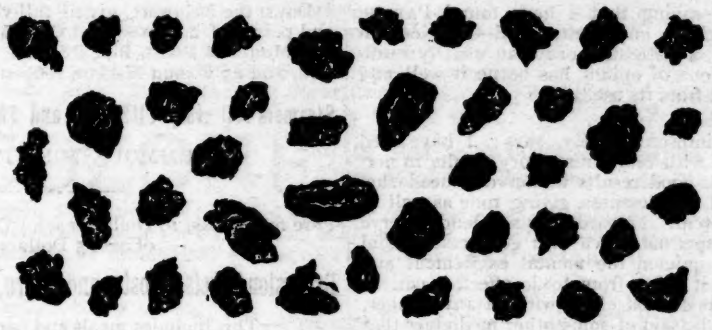

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Apparatus made, after measurement, for Paralysis, Knock-knee, Bowleg, Weak Ankles, Club-foot, Hip Disease, and all Fractures pertaining to the Human Frame. Also Kolbe's Spinal Supporters, etc.

Send for Catalogues, also Treatise on Club-foot, and Measurement Blanks.

Manufacturers for Pennsylvania, German and Orthopædic Hospitals; also Cooper Hospital, of Camden.

All goods manufactured in our workshop.

Elastic Goods, Suspensory Bandages, Trusses, Abdominal Supporters, Shoulder Braces, etc.

Kimbell-Kolbe Pat. Steel Skeleton Limbs. Also Kolbe's Willow Legs and Pat. Arms.

An Open Letter to the Medical Profession.

THE INFANT FOOD PROBLEM SOLVED.

NEW YORK, *May* 1, 1890.

The Annual of the Universal Medical Sciences for 1889, says: "*A perfect Infant Food is still a desideratum; such a food will probably be evolved in the mind of some manufacturer who understands the physiology of infantile digestion and the chemistry of milk. A substitute for human milk, to approximate the latter closely, should be made entirely from cow's milk, without the addition of any ingredient not derived from milk.*

"*But not alone do we demand that these Milk Foods contain the equivalent of the solids in human milk, and especially of the albuminoids derived from milk, but that the latter be gathered with the utmost care from properly fed animals, transported with the least possible jolting to the factory, maintained during its transit at a low temperature, then transferred to an apparatus for sterilization, and immediately after the latter has been accomplished reduced to the dry state, in order to prevent the formation of those organisms which Loeffler, Pasteur, and Lister have found to develop in fluid milk after boiling under an alkaline reaction. If such a preparation be put into air-tight and sterilized jars, all will have been accomplished that can be done to render the food sterile, and thus fulfil the chief indications in the prevention of the most serious gastro-intestinal derangements.*

'*Such a food, too, would have the advantage of being easily and rapidly prepared by addition of sterilized water, affording an altogether sterilized food.*"

To the *Medical Profession* at large, we submit for examination and trial the perfect Milk Food known as LACTO-PREPARATA. We claim that LACTO-PREPARATA is an *ideal Infant Food*, and that it fulfils the above requirements in every particular, except the partial substitution of cocoa-butter for unstable milk-fat. This substitution was made by advice of Prof. Attfield, London, who made extensive tests of its food value and digestibility in the London Hospitals for Infants.

LACTO-PREPARATA is made from cow's milk evaporated in vacuo a few hours after it leaves the udder. In order to have the product correspond in composition with breast-milk, sufficient milk-sugar is added to bring up the carbohydrates and reduce the albuminoids to a proper proportion (17 per cent.). The casein is partially predigested (30 per cent.), and the remaining portion is rendered like human milk in character and digestibility. The ingredients are perfectly sterilized and placed in hermetically sealed cans; the powdering, bolting, and canning are done in an air-tight room, all air entering and leaving this room is forced by a blower through heavy layers of cotton. LACTO-PREPARATA is adapted more especially to infants from birth to six months of age; *and by the addition of water alone represents almost perfectly human milk in taste, composition, and digestibility.*

Another product of our laboratory, which has been before the profession for a number of years, is CARNRICK'S SOLUBLE FOOD, which, as now prepared and perfected, contains 37½ per cent. of the solid constituents of milk, 37½ per cent. of wheat with the starch converted into dextrine and soluble starch, and 25 per cent. additional milk-sugar. For infants over six months of age it is perfect in every respect; for infants younger than this, LACTO-PREPARATA is more suitable, although *Soluble Food* has also been used largely from birth with most satisfactory results.

Samples will be sent prepaid, also pamphlet giving detailed description.

REED & CARNRICK,

NEW YORK.

PEPSIN IN INFANTILE DIARRHŒA.

In a recent number of a Journal appears an advertisement under the above caption, which goes on to show that "one of the causes which incites and perpetuates the gastric and intestinal inflammation is undigested, or partially digested, fermenting milk or other food," and that "it is as an aid to the removal of this cause, both in predigesting milk or other food before it is given, and in digesting fermented undigested food in the stomach, that pepsin is indicated in infantile diarrhœa, and its efficacy has been well attested by many well known medical writers," all of which is undoubtedly true.

But the active principles of commercial pepsins are the pepsin ferment proper, and the milk-curdling ferment, and it being only the latter that is concerned in the diet of nursing infants, just to the extent a pepsin contains the curdling ferment is it useful in infantile diarrhœa. Hence, all that the advertising company referred to has to say about the wonderful digestive power of its pepsin as applied to *albumen*, is something like trying to prove black to be white by stating that something else is white—in other words, assuming the statement of the company to be true as regards the digestive power of its pepsin (and it is an assumption), such a mode of test is no proof whatever of the value of the article in infantile diarrhœa.

That the pepsin referred to possesses the *very odor* that its manufacturer names as characteristic of putrefaction, is not only a self-condemnatory fact, but is a sign of danger inadvertently hung out by this would be authority.

All soluble forms of what are termed pure pepsin (*i. e.* free from added material) are more or less hygroscopic, and the pepsin referred to is no exception in this particular—though the company manufacturing it claim the contrary. Any one can prove this by exposing to the air, side by side during damp weather samples of soluble pepsins, using for control a sample of Ford's Pepsin which will be found unaffected by prolonged contact with moist air. Air, heat and moisture are the essential conditions of putrefaction. Either of the two former cannot be guarded against in the case of pepsin, nor is it necessary that they should if ordinary care is exercised against unnecessary exposure. When a manufacturer advises the use of a hygroscopic pepsin as though it were non-hygroscopic, there is liable to be rapid deterioration if the user obeys instructions, and consequently but little medicinal advantage derived, no matter how high the test of the article when fresh.

The medical profession has so long and successfully used **GOLDEN SCALE PEPSIN** for liquid forms and combinations, and **FORD'S PEPSIN** for all dry forms where exposure has been necessary, and either or both for predigestion of foods as well that they may well be ranked as **THE STANDARD PEPSINS.** These have stood the test of time, and withstood the attacks of competitors, therefore must possess intrinsic merits which is the best endorsement.

NEW YORK AND CHICAGO CHEMICAL COMPANY
96 MAIDEN LANE, NEW YORK.

GONORRHŒA

GONORRHŒA, GLEET, and all other urethral diseases, can be most successfully treated by using Soluble Medicated Bougies. A compact little pamphlet of 24 pages, on "THE TREATMENT OF GONORRHŒA AND ITS SEQUELÆ," by means of medicated bougies, containing many valuable hints on treatment, will be sent *free*, together with samples of the bougies, to any physician who will mention THE TIMES AND REGISTER, and enclose his business card or letter heading.

Address, **CHARLES L. MITCHELL M.D.**
Manufacturer of Soluble Medicated Gelatine Preparations,
1016 Cherry Street, Philadelphia.

COLLEGE of PHYSICIANS and SURGEONS, of BALTIMORE, MD.

The Preliminary Course will begin September 15, 1890.
The Regular Session will open October 1, 1890, and close April 1, 1891.
For catalogue containing full information, write to
THOMAS OPIE, M.D., Dean,
N. W. cor. Calvert and Saratoga Streets, Baltimore, Md.

Alcohol and Opium Cases.

Private Apartments in the homes of physicians (but one case in each) with every convenience, and all modern appliances for treatment. Strict privacy guaranteed. Skilled attendance. Address,
WILLIAM F. WAUGH, M. D.,
1725 Arch St., Philadelphia, Pa.

PRIVATE SANITARIUM,

For Medical and Surgical Treatment of Diseases of Women.
DR. E. E. MONTGOMERY,
1818 Arch St., Phila.

MEDICO-CHIRURGICAL COLLEGE OF PHILADELPHIA.

The Regular Session begins October 1, 1890, and continues until the middle of April. It is preceded by a Preliminary Session of three weeks and followed by a Spring Session lasting until the middle of June.

Seats are issued in the order of matriculation, and are forfeitable if fees are not paid before November 1.

Preliminary examination, or equivalent degree and three years graded course, obligatory.

Instruction is given by lectures, recitations, clinical teaching, and practicable demonstrations. In the subjects of Anatomy, Pharmacy, Physiology, Hygiene, Therapeutics, Histology, and Pathology, the usual methods of instruction are largely supplemented by laboratory work.

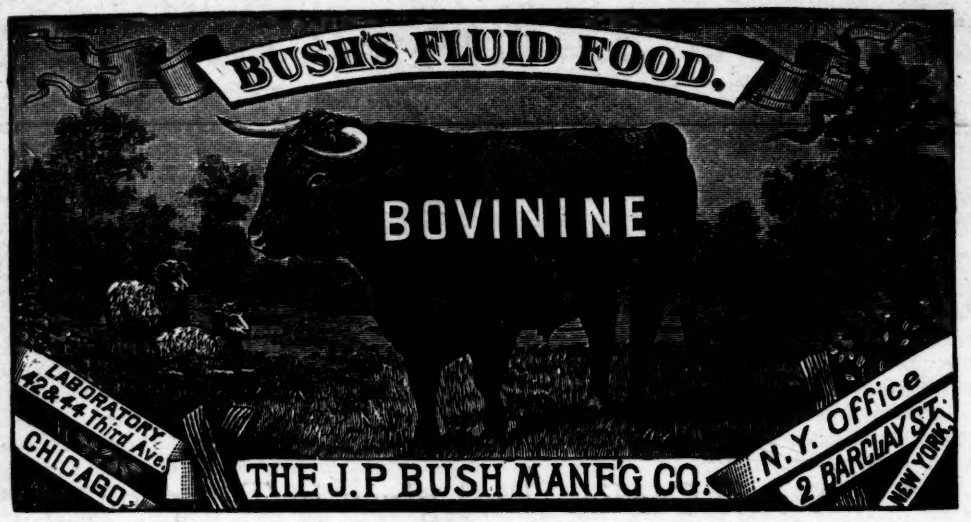
Examinations are held at the close of each Regular Session upon the studies of that term. Although the degree of Doctor of Medicine is conferred at the end of the third year, a fourth year is earnestly recommended, at the end of which the degree of Doctor of Medicine cum laude is given.

FEES.—Matriculation, $5; first and second years, each, $75; third year (no graduation fee), $100; fourth year free to those who have attended three Regular Sessions in this school, to all others, $100. Extra charges only for material used in the laboratories and dissecting-room. For further information or announcement address, E. E. MONTGOMERY, M.D., Secretary, Medico-Chirurgical College, Cherry St., below 18th St., Phila., Pa.

PARTURITION.

Aletris Cordial [Rio], given in Teaspoonful doses every hour or two AFTER PARTURITION, is the best agent to prevent after-pains and hemorrhage. By its DIRECT tonic action on the uterus it expels blood clots, closes the uterine sinuses, causes the womb to contract, and prevents subinvolution. In severe cases it can be combined with ergot in the proportion of one ounce of fluid Ext. Ergot to three ounces Aletris Cordial. It is the experience of eminent practitioners, in all cases where ergot is indicated, that its action is rendered much more efficacious by combining it with Aletris Cordial in the proportions above stated.

Soothes Ulcerated and Cancerous Condition of the Digestive Tract.



Indispensable in Phthisis, Pneumonia and Acute Bronchitis.

RAW FOOD EXTRACTS AND THEIR VALUE.

FROM AN ESSAY READ BEFORE THE AMERICAN MEDICAL ASSOCIATION AT WASHINGTON, D. C., MAY 6th, 1884,

BY B. N. TOWLE, M.D, OF BOSTON.

"Nervous debility and neuralgia are often the results of nerve starvation. They are now, more than ever, the dread of every intelligent physician, and the terror of all business men. The weary hours of pain, and the sleepless nights of those suffering from nervous diseases, are but the beseechings of an exhausted nerve for food. Hungry and starved, they make their wants known by the pain they set up as their only agonizing cry; and no medication will give permanent relief until the hunger is satisfied.

Our research, then, must be to find a more easily digested and assimilated food.

Observation seems to sanction the fact that vegetable food elements are more readily assimilated by persons of feeble digestion than are the animal food elements, and especially when they have undergone the digestive process in the stomachs of healthy cattle. The juices of these animals, when healthy and fat, *must* contain all the food elements in a state of solution most perfect, and freed from all insoluble portions, and hence in a form more easily assimilated than any other known food.

I have used Raw Food Extracts for more than eight years, in a large number and variety of cases, and in no case of malnutrition has it failed to give relief.

I have given it to patients continuously for months, with signal benefit, especially in complicated cases of dyspepsia, attended with epigastric uneasiness arising from enervation, and in nervous debility of long standing. The sudden and full relief this food affords patients who have a constant faintness at the stomach, even immediately after taking food, shows how readily it is assimilated. This faintness is a form of hunger, and is the cry of the tissues for food, not quantity but quality—a food that the famishing tissues can appropriate and thrive upon.

Raw Food is equally adapted to lingering acute diseases. I have used it in the troublesome sequelæ of scarlatina, where there was exhaustion from abscesses in the vicinity of the carotid and submaxillary glands; and in protracted convalescence from typhoid fever, with marked advantage. The cases that I especially value it in are laryngeal consumption and nervous exhaustion, in which cases there is always more or less derangement of the digestive tract, such as pain in the stomach, constipation, eructation of gases, distress after taking food, etc. Raw Food should be taken with each meal, the patients taking such other food as they can readily digest, in quantities suited to the individual case.

It adds much to the nutrition of the patient, overcomes the constipation, subdues the nervousness by increasing the strength, and is just the amount added which is required to secure success."

The unsolicited opinion of Surgeon-General Murray, U. S. A. (Retired).

"It gives me pleasure to give my testimony to the very great value of BOVININE as a dietetic preparation. I have used it for more than a year in a very aggravated case of nervous dyspepsia, and have found it to answer very much better than any of the many preparations or extracts of meat before used.

I find that it keeps perfectly even in the warmest weather; is very easily prepared for administration, and it has proved acceptable and beneficial in every case in which I have known it to be given."

PHILADELPHIA, PA., March 1st, 1887.

Very respectfully and truly yours,

R. MURRAY, M.D.,
Surgeon General (Retired) U. S. A.

SAMPLES SENT TO PHYSICIANS ON APPLICATION.

PALATABLE, NUTRITIOUS AND EASILY ASSIMILATED BY THE MOST DEBILITATED DIGESTIVE ORGANS.

Put up in 6 and 12 Ounce Sizes, at 60 cents and $1.00 per Bottle.

12 Ounces contain the Strength of 10 Pounds of Meat.

CAREFULLY PREPARED BY THE

J. P. BUSH MFG. CO.,

Barclay Street, Astor House, New York — 42 and 44 Third Avenue, Chicago

ARISTOL.

ARISTOL, a combination of iodine and thymol, manufactured by the Farbenfabriken, formerly Friedr. Bayer & Co., Elberfeld, Germany, is a valuable, inodorous and non-toxic antiseptic remedy said to be superior to Iodoform, Iodole and Sozo-Iodole.

ARISTOL is insoluble in water and glycerine, and very sparingly in alcohol, but is very easily soluble in ether and chloroform. The ether solution is precipitated by the addition of alcohol. ARISTOL is very freely soluble in fatty oils. The solution must be made in the cold, by stirring, as the use of heat causes a decomposition. For the same reason it is necessary to protect the body from the light and keep it in opaque bottles. It very readily adheres to the skin, and can thus be used as a powder strewn over wounds and burns.

In cases of mycosis it also acts well, and more quickly than any other known remedy, and does not cause irritation, like so many drugs.

The effective use of ARISTOL in psoriasis is of great interest, as our Materia Medica has hitherto supplied us with no non-poisonous drug, save only chrysarobin, the use of which is associated with a deep skin coloration and conjunctivitis—drawbacks from which ARISTOL is absolutely free.

In cases of lupus it is said to surpass even the best known remedies.

The value of ARISTOL can scarcely be over-estimated, as we have in it a drug possessing the good properties of Iodoform, but free from its toxic qualities. Its freedom, too, from any suspicious odor will be at once appreciated, both by the physician and his patient.

ARISTOL, prepared by the Farbenfabriken, formerly Friedr. Bayer & Co., Elberfeld, is supplied by us in ounces.

SULFONAL-BAYER.

The value of Sulfonal in children's diseases.—Dr. William C. Wile sent a paper with this title to the American Medical Association, in which he stated that Sulfonal was the ideal hypnotic. It was without the bad effects of opium and the uncertainty of the bromides. It could be given in ten-grain doses. It quieted reflex irritability. It did not constipate nor disturb the stomach. In one case in which a drachm was taken accidentally in ten-grain doses, there was a deep slumber lasting twenty-four hours, slight fever, but a normal pulse and respiration.—*Medical Record*, New York.

Dr. Henry M. Field, in a paper presented to the American Medical Association, says: "Clinically observed, we recognize in Sulfonal a mild calmative, *a slowly, but progressively acting hypnotic;* it has no other action, and its operation is attended by no complications, near or remote. It is therefore a pure hypnotic, and, we submit, it is the only pure hypnotic we possess, up to date." — *New England Medical Monthly.*

Sulfonal-Bayer, prepared by the Farbenfabriken, formerly Friedr. Bayer & Co., Elberfeld, is supplied by us in ounces, and in the form of tablets of 5, 10 and 15 grains, put up in bottles of 10 and 100 tablets each. We also offer Sulfonal-Bayer in the form of our soluble pills containing 5 grains each.

PHENACETINE-BAYER.

Phenacetine in Insomnia.—Dr. F. Peyre Porcher, of Charleston, S. C., writes: "I desire to call special attention to the extreme value of Phenacetine as a remedy for insomnia. Given at night in a little water it is tasteless, innocuous, and induces sleep. I am confident, also, after repeated trials, that it is the best and most unobjectionable substitute for morphia. It causes sleep when, of course, pain is in abeyance, unless the pain be more than ordinary, and morphia hypodermically may then be required. The remedy may be repeated and the dose increased to seven or ten grains.

"Suffering from chronic rheumatism of the forearm, I have tested it repeatedly in my own person, and have given it to many who have suffered from insomnia, or inability to sleep from any transient cause, fatigue, nervousness, excitement, etc., in either sex." * * * *Med. Rec.*, New York.

Phenacetine-Bayer, prepared by the Farbenfabriken, formerly Friedr. Bayer & Co., Elberfeld, is supplied by us in ounces and also in the form of our soluble pills and compressed tablets, containing two, four and five grains each. Either form may be obtained of any reputable apothecary.

It gratifies us to be able to announce that PHENACETINE, SULFONAL and SALOL have been incorporated into the new German Pharmacopœia just issued, and have been proposed by the General Medical Council of Great Britain for introduction into the forthcoming Addendum to the British Pharmacopœia. This action confirms and endorses our judgment in introducing these valuable remedies to the medical profession of the United States, and is a natural sequence of the favorable results experienced in their employment, and of the brilliant and conclusive testimony thereof, which had been so freely furnished by the most talented of the profession both in Europe and in the United States.

W. H. Schieffelin & Co.,
170 & 171 William Street,
NEW YORK.

FELLOWS' HYPO-PHOS-PHITES

(Syr: Hypophos: Comp: Fellows)

Contains **The Essential Elements** to the Animal Organization—Potash and lime.

The **Oxydizing Agents**—Iron and Manganese;

The **Tonics**—Quinine and Strychnine;

And the **Vitalizing Constituent**—Phosphorus,

Combined in the form of a Syrup, with *slight alkaline reaction.*

It Differs in Effect from all others, being pleasant to taste, acceptable to the stomach, and harmless under prolonged use.

It has Sustained a High Reputation in America and England for efficiency in the treatment of Pulmonary Tuberculosis, Chronic Bronchitis, and other affections of the respiratory organs, and is employed also in various nervous and debilitating diseases with success.

Its Curative Properties are largely attributable to Stimulant, Tonic, and Nutritive qualities, whereby the various organic functions are recruited.

In Cases where innervating constitutional treatment is applied, and tonic treatment is desirable, this preparation will be found to act with safety and satisfaction.

Its action is Prompt; stimulating the appetite and the digestion, it promotes assimilation, and enters directly into the circulation with the food products.

The Prescribed Dose produces a feeling of buoyancy, removing depression or melancholy, and hence is of great value in the treatment of Mental and Nervous Affections.

From its exerting a double tonic effect and influencing a healthy flow of the secretions, its use is indicated in a wide range of diseases.

Prepared by JAMES I. FELLOWS, Chemist,

48 VESEY STREET, NEW YORK.

Circulars and Samples sent to Physicians on application.

UPJOHN'S FRIABLE PILLS.

INASMUCH as our competitors have been energetically making mis-statements regarding our goods, trying to frighten practitioners from their use, we deem it but right for us to give a few of our friends an opportunity to speak for us in denial of the false statements made.

COHOES, N. Y., Sept. 11, 1889.

The U. P. & G. Co.,

Gents: Your letter and also pocket case received. I am delighted with it. Like all of your goods, it is elegant and just my ideal of what a pocket case should be. I have long been using Upjohn's Pills and consider them handsome, well finished and always uniform and reliable. Rest assured that I shall continue to use them and will be more than pleased to say a good word for them at any and all times.

Very truly yours, C. E. Witbeck

N. Y., May 27, 1889.

The U. P. & G. Co.,

Gentlemen: We enclose herewith money order for amount of invoice of May 22. We shall be pleased to order of you when our present stock is exhausted. Your pills so far are giving perfect satisfaction.

Yours very truly, Thomas J. Keenan,
N. Y. Polyclinic, Hospital and Dispensary.

WATERFORD, N. Y., Feb. 1, 1889.

The U. P. & G. Co.,

Gentlemen: Enclosed please find check for amount of statement received. Your Quinine Pills give perfect satisfaction to our physicians; we have sold about sixty ounces within the past year.

Respectfully, John Higgins & Co.

NEWTON, N. J., July 5, 1889.

The U. P. & G. Co.,

Dear Sirs: We have used your Quinine Pills exclusively for the last two years, and are entirely pleased with them. Yours, etc., H. O. Ryerson & Co.

ELMIRA, N. Y., July 19, 1889.

The U. P. & G. Co.,

Dear Sirs: Case of granules received. I am very much pleased with the Upjohn Pills and believe the process will eventually revolutionize the manufacture of pills. Yours truly, F. B. Parke, M.D.

COHOES, N. Y., Aug. 23, 1889.

The U. P. & G. Co.,

Gents: Enclosed please find New York draft for invoice of July 31 for Private Formula No. 1332.

I must say that the pills are very nicely made and also work to a charm. Please note me 50,000 lots of same.

Respectfully yours,
Jonas S. Ten Eyck.

NEW ROCHELLE, N. Y.

The U. P. & G. Co.,

Gents: I have found your case a great convenience and its contents have been very helpful to my patients. The case has already paid for itself *ten times over*.

Yours, E. W. Finch, M.D.

NORTH MANCHESTER, IND., Sept. 14, 1889.

The U. P. & G. Co.,

Dear Sirs: I have received the pills manufactured by your house (Special Formula) and I like them very much. When I need anything in your line I know where to get it. Enclosed you will find money order in satisfaction of same. Yours truly,

D. A. Goshorn, M.D.

TERRE HAUTE, IND., July 23, 1889.

The U. P. & G. Co.,

Dear Sirs: Recently when prescribing pills and granules, I have specified those of your manufacture. They have invariably given the best of satisfaction.

Yours very truly,
Cort F. Askren, M.D.

SHELBYVILLE, ILL., Oct. 19, 1887.

The U. P. & G. Co.,

My Dear Sirs: The pills came to hand this morning; enclosed find P. O. Order for same. I am very grateful to you for sending them. I have always found your goods reliable. Respectfully,

Dr. A. M. Collins.

"THIS IS AN AGE OF APOLLINARIS WATER."
—*Walter Besant.*

Apollinaris

"THE QUEEN OF TABLE WATERS."

The filling at the Apollinaris Spring [Rhenish Prussia]
amounted to

11,894,000 BOTTLES IN **1887,**
12,720,000 BOTTLES IN **1888** AND
15,822,000 BOTTLES IN **1889.**

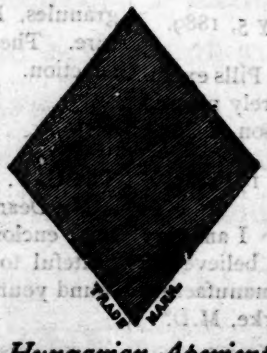
"*The annual consumption of this favorite beverage affords a striking proof of the wide-spread demand which exists for table water of absolute purity, and it is satisfactory to find that, wherever one travels, in either hemisphere, it is to be met with; it is ubiquitous, and should be known as the cosmopolitan table water. 'Quod ab omnibus, quod ubique.'*"—British Medical Journal.

The Best Natural Aperient.

THE APOLLINARIS COMPANY, Limited, London, beg to announce that, as numerous Aperient Waters are offered to the public under names of which the word "**Hunyadi**" forms part, they have now adopted an additional Label comprising their registering Trade Mark of selection, which consists of

A Red Diamond.

This Label will henceforth also serve to distinguish the Hungarian Aperient Water sold by the Company from all other Aperient Waters.

DEMAND THE 

DIAMOND MARK.

And insist upon receiving the *Hungarian Aperient Water* of the APOLLINARIS COMPANY, Limited, London.